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MANAGEMENT

A BIBLIOGRAPHY FOR NASA MANAGERS

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FOREWORD

Management gathers together references to pertinent documents -- reports, journal articles, books -- that will assist the NASA manager to be more productive. Items are selected and grouped according to their usefulness to the manager *as manager*. A methodology or approach applied to one technical area may be worthwhile for a manager in a different technical field.

Individual sections can be quickly browsed. Indexes will lead quickly to specific subjects or items.

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HIGHLIGHTS AND ITEMS OF INTEREST

Several changes have been incorporated into the organizational subject categories for this year's bibliography. Citations are grouped into ten categories. One category from last year's bibliography (RESOURCE MANAGEMENT) has been dropped. Two new categories, INDUSTRIAL MANAGEMENT AND MANUFACTURING (03) and COMPUTERS AND INFORMATION MANAGEMENT (05), have been added. Other changes and additions to the category scope notes appear in the Table of Contents below.

Human Factors And Personnel Issues. Personnel issues -- management, development, selection, allocation, etc. -- are now covered in this category. Organizational behavior is discussed in terms of temporary task teams (A84-31212) and the relationship between social support and performance (N84-24098). Devitalization of workers is seen as an important motivational and morale problem for management (N84-13013); two theses explore the relationships between motivation and performance (N84-27584, N84-27441). Successful interaction between employee and computer may depend on long-range educational programs (N84-22357). Others work to investigate and improve the actual software interfaces (A84-21640, N84-20181, N84-14795).

Management Theory and Techniques. The general management literature ranges from the overview and the theoretical (A84-23989) to the practical and the methodological (A84-15600). Similarly, many papers treat the theory and mathematics of decisions and decision making models (A84-33465, A84-19141, N84-22342, N84-21395, etc.); others discuss pragmatic, "how-to-do-it," approaches to decision making (N84-28466, N84-25503, etc.). Closely related to studies of decisions are explorations of leadership and leadership styles (A84-42622, N84-28448, N84-28414, etc.). Among numerous analyses of organizational structures and processes, several authors focus on the concept of "organizational climate" (N84-27595, N84-19132, N84-16068).

Industrial Management and Manufacturing. The relationships between science, technology, government, industry and academia are complex and varied (N84-23319, N84-19605, N84-10353, N84-10351). A recent factor influencing such relationships is the microcomputer; one of several industries benefiting from the microprocessor is construction (N84-14701, N84-14700, N84-11053, etc.). Problems and challenges facing manufacturers now encompass the rigors of outer space (A84-22344, A84-24632). Many authors discuss industrial productivity (N84-23318, N84-18449, N84-18448, etc.); some offer specific advice, such as "keeping your fingers crossed won't help" (N84-14702).

Robotics and Expert Systems. Robotics represents a burgeoning arena for the applications of automation advancements; however, the reactions of the robots' coworkers -- the humans -- need serious consideration (N84-32826, N84-15805). Artificial intelligence techniques benefit a variety of applications, including management of models and support of decisions (N84-25357), networking (N84-31743), information retrieval (N84-11821), scheduling (N84-13867), and maintenance (N84-20730). Computer-aided-design (CAD) and computer-aided-manufacturing (CAM) are the subjects of numerous papers (A84-28014, N84-20867, N84-16829, etc.).

Computers and Information Management. An understanding of microcomputers and software is becoming increasingly important to managers. Practical suggestions and principles are offered by some authors (N84-34316, N84-23150). Numerous papers document the details of software acquisition (A84-10015, N84-35131), software development and engineering (A84-24449, N84-14730, N84-12747, N84-11781), and software management (A84-26710, N84-13818). An important related conceptual area is that of configuration management in a computer context (A84-26713, A84-16633, A84-15309, N84-14742). Many computer and ADP facilities are members of networks (A84-49262, A84-31351, N84-17927). And computers must learn to talk to each other (N84-27457, N84-19179, N84-16432). Important information about the management enterprise may be stored on or retrieved from a database system (N84-22316, N84-20438, N84-19176). Information should be well organized and presented in the proper format (A84-45572, A84-33153, N84-16831). And many writers express the need for improving information security (N84-30736, N84-26317, N84-21402).

Research and Development. An essential tool of today's successful R&D manager is the knowledge of contracts and contract management (A84-15304, N84-32297, N84-23315), as well as general project management principles (N84-23369, N84-14965, N84-11977). Technology transfer is the subject of many papers this year (A84-42620, N84-25528, N84-11035, etc.), as is the related issue of support for invention and innovation (N84-11043, N84-11042).

Economics, Costs and Markets. Outer space provides many outlets for private investment and commercialization (A84-29881, A84-20599, A84-17063, A84-11739, N84-15165, N84-10108, etc.) and opportunities for competition (A84-29883, N84-23321, N84-23320, etc.). Microcomputers, statistical packages, and databases are becoming more essential to those seeking to control costs and maximize productivity (A84-31794, N84-22287, N84-20444, N84-14697). Closely related to the control of costs are the management of risk (N84-23335, N84-23304, N84-23301) and the analysis of value (A84-15320, N84-25504).

Logistics and Operations Management. The computer continues to influence the techniques and models of logistical management (N84-28671, N84-18108, N84-15884, N84-14711). The microcomputer, especially, holds great promise for the handling of spare parts (N84-23353, N84-21112), the monitoring and maintenance and repair (A84-46582), and the modeling of the transportation system (N84-33067).

Reliability And Quality Control. Important applications of recent quality control efforts include the creation of software engineering standards (A84-24450, A84-10028, N84-21129, N84-21128, etc.) and the application of quality assurance techniques (A84-15597, N84-30778, N84-23361). Such attempts illustrate the idea that "quality is not a dirty word" (N84-12510) -- in spite of past practices and international competition (N84-23363).

Legality, Legislation, and Policy. What are the effects on the aviation industry of deregulation (A84-36942, A84-25033, A84-20675, N84-14070)? How does recent legislation affect space commercialization activities (A84-29868, A84-29865, A84-17055, N84-34329, N84-11069)? And how has the insurance industry responded to opportunities in the space market (A84-20646, A84-16892)?

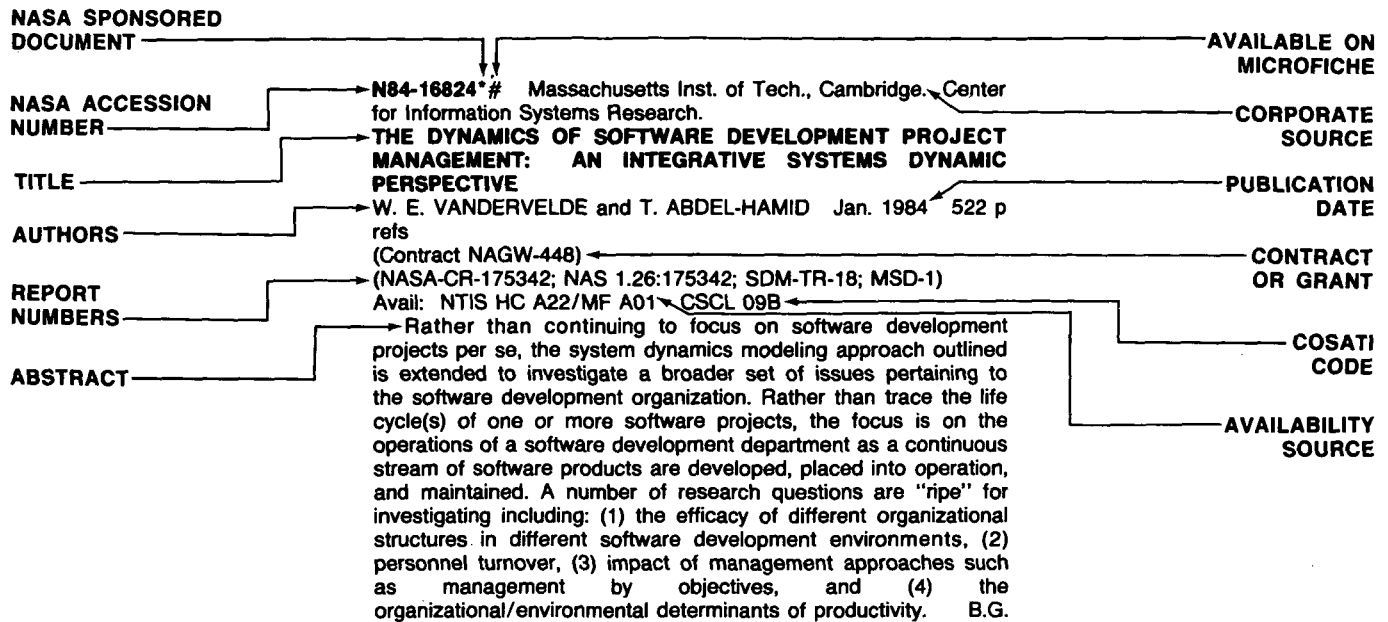
*For abstracts of the indicated items refer to the accession number index.

TABLE OF CONTENTS

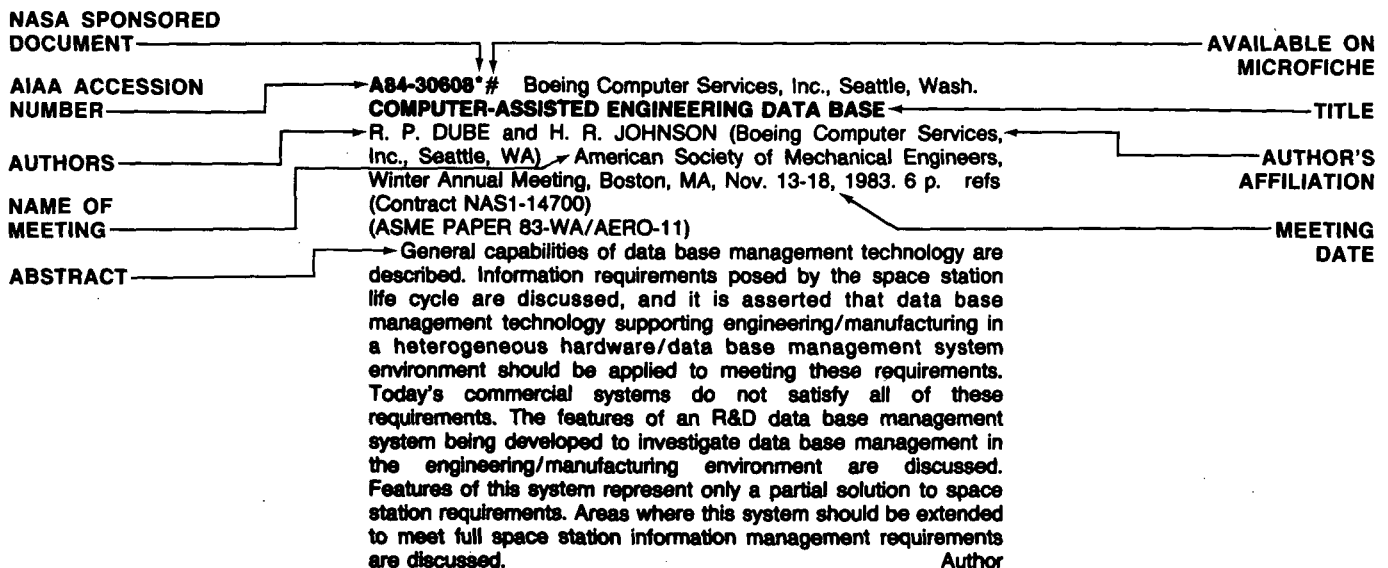
	Page
Category 01 Human Factors and Personnel Issues	1
Includes organizational behavior, employee relations, employee attitudes and morale, personnel management, personnel development, personnel selection, performance appraisal, training and education, computer literacy, human factors engineering, ergonomics, human-machine interactions.	
Category 02 Management Theory and Techniques	12
Includes management overviews and methods, decision theory and decision making, leadership, organizational structure and analysis, systems approaches, operations research, mathematical/statistical techniques, modeling, problem solving, management planning.	
Category 03 Industrial Management and Manufacturing	25
Includes industrial management, engineering management, design engineering, production management, construction, aerospace/aircraft industries, manufacturing.	
Category 04 Robotics and Expert Systems	31
Includes artificial intelligence, robots and robotics, automatic control and cybernetics, expert systems, automation applications, computer-aided design (CAD), computer-aided manufacturing.	
Category 05 Computers and Information Management	37
Includes information systems and theory, information dissemination and retrieval, management information systems, database management systems and databases, data processing, data management, communications and communication theory, documentation and information presentation, software, software acquisition, software engineering and management, computer systems design and performance, configuration management (computers), networking, office automation, information security.	
Category 06 Research and Development	59
Includes contracts and contract management, project management, program management, research projects and research facilities, scientific research, innovations and inventions, technology transfer and utilization, R&D resources, agency, national and international R&D.	
Category 07 Economics, Costs and Markets	66
Includes costs and cost analysis, cost control and cost effectiveness, productivity and efficiency, economics and trade, financial management and finance, investments, value and risk (monetary), budgets and budgeting, marketing and market research, consumerism, purchasing, sales, commercialization, competition, accounting.	

Category 08 Logistics and Operations Management	78
Includes inventory management and spare parts, materials management and handling, resources management, resource allocation, procurement management, leasing, contracting and subcontracting, maintenance and repair, transportation, air traffic control, fuel conservation, operations, operational programs.	
Category 09 Reliability and Quality Control	88
Includes fault tolerance, failure and error analysis, reliability engineering, quality assurance, wear, safety management and safety, standards and measurement, tests and testing inspections, specifications, performance tests, certification.	
Category 10 Legality, Legislation, and Policy	96
Includes laws and legality, insurance and liability, patents and licensing, legislation and government, regulation, appropriations and federal budgets, local, national, and international policy.	
Subject Index	A-1
Personal Author Index	B-1
Corporate Source Index	C-1
Contract Number Index	D-1
Report Number Index	E-1
Accession Number Index	F-1

TYPICAL CITATION AND ABSTRACT FROM STAR



TYPICAL CITATION AND ABSTRACT FROM IAA



MARCH 1985

01

HUMAN FACTORS AND PERSONNEL ISSUES

Includes Organizational Behavior, Employee Relations, Employee Attitudes and Morale, Personnel Management, Personnel Development, Personnel Selection, Performance Appraisal, Training and Education, Computer Literacy, Human Factors Engineering, Ergonomics, Human-Machine Interactions.

A84-14980

CONFLICTS AMONG EMPLOYEES AND WAYS OF RESOLVING THEM [KONFLIKTY V TRUDOVOM KOLLEKTIVE I PUTI IKH RAZRESHENIIA]

V. V. BOIKO and A. G. KOVALEV (Leningrad Institute of Culture, Leningrad, USSR) *Psikhologicheskii Zhurnal*, vol. 4, May-June 1983, p. 51-60. In Russian. refs

A84-14981

THE INFLUENCE OF FORMS OF WORK ORGANIZATION ON PERSONAL RESPONSIBILITY IN PRODUCTION WORK [VLIYANIE FORM ORGANIZATSII TRUDA NA OTVETSTVENNOST' LICHNOSTI NA PROIZVODSTVE]

K. MUZDYBAEV (Academy of Sciences, Institute of Social Economic Problems, Leningrad, USSR) *Psikhologicheskii Zhurnal*, vol. 4, May-June 1983, p. 61-69. In Russian. refs

A84-19308#

TIMELY APPLICATION OF ADVANCED HUMAN FACTORS TEST AND EVALUATION TECHNIQUES DURING THE ACQUISITION OF NEW AIR FORCE SYSTEMS

M. L. FRAZIER (USAF, Operational Test and Evaluation Center, Kirtland AFB, NM) IN: Human Factors Society, Annual Meeting, 27th, Norfolk, VA, October 10-14, 1983, Proceedings. Volume 1. Santa Monica, CA, Human Factors Society, 1983, p. 581-583.

A model is proposed for the transfer of human factors technologies for test and evaluation of modern Air Force systems. A two-pronged effort is recommended to ensure the availability of appropriate technology for new Air Force acquisitions: revise Air Force policies indicated in Air Force Regulation 800-15 and ensure timely state-of-the-art human factors technology flow which parallels the major system acquisition process. An essential element in the model is to establish liaison activities between the system test and evaluators and the advanced developers and researchers.

D.H.

A84-21640

DMS - A SYSTEM FOR DEFINING AND MANAGING HUMAN-COMPUTER DIALOGUES

R. W. EHRICH (Virginia Polytechnic Institute and State University, Blacksburg, VA) *Automatica* (ISSN 0005-1098), vol. 19, Nov. 1983, p. 655-662. refs
(Contract N00014-81-0143)

As the complexity of human-computer interfaces increases, those who use such interfaces as well as those responsible for their design have recognized an urgent need for substantive research in the human factors of software development. Because of the magnitude of the task of producing software for

human-computer interfaces, appropriate tools are needed for defining and improving such interfaces, both in research and in production environments. DMS (dialogue management system) is a complete system for defining, modifying, simulating, executing, and monitoring human-computer dialogues. It is based upon the hypotheses that; (1) dialogue software should be designed separately from the code that implements the computational parts of an application, and (2) different roles are defined for the dialogue author and the programmer to achieve that goal. This paper discusses several of the technical aspects underlying the design of DMS.

Author

A84-23706

SOCIAL-PSYCHOLOGICAL PROBLEMS IN THE EVALUATION OF ENGINEERING PERSONNEL IN AUTOMATED SYSTEMS FOR THE CONTROL OF DEVELOPING ENTERPRISES [SOTSIAL'NO-PSIKHOLOGICHESKIE PROBLEMY DIAGNOSTIKI INZHENERNYKH KADROV V AVTOMATIZIROVANNYKH SISTEMAKH UPRAVLENIIA RAZRABATYVAIUSHCHIKH PREDPRIIATII]

E. S. CHUGUNOVA (Leningradskii Gosudarstvennyi Universitet, Leningrad, USSR) and N. A. VIKTOROV *Psikhologicheskii Zhurnal*, vol. 4, July-Aug. 1983, p. 87-95. In Russian. refs

A84-23990

MANAGING CREATIVE INDIVIDUALS IN HIGH-TECHNOLOGY RESEARCH PROJECTS

W. B. ZACHARY (San Jose State University, San Jose, CA) and R. M. KRONE (Southern California, University, Los Angeles, CA) *IEEE Transactions on Engineering Management* (ISSN 0018-9391), vol. EM-31, Feb. 1984, p. 37-40. refs

A84-29482

DEVELOPMENT AND APPLICATION OF A CRITERION TASK SET FOR WORKLOAD METRIC EVALUATION

C. A. SHINGLEDECKER (USAF, Aerospace Medical Research Laboratory, Wright-Patterson AFB, OH), W. H. ACTON, and M. S. CRABTREE (Systems Research Laboratories, Inc., Dayton, OH) IN: Aerospace Behavioral Engineering Technology Conference, 2nd, Long Beach, CA, October 3-6, 1983, Proceedings. Warrendale, PA, Society of Automotive Engineers, Inc., 1983, p. 43-49. refs

(SAE PAPER 831419)

In order to optimize the design and operation of modern military aircraft systems, methods are needed to measure the mental workload of the human operator. While numerous candidate metrics are now available for this purpose, little prescriptive information exists to guide their selection and application. This paper describes the development of a standardized methodology for the evaluation of workload measures against several theoretical and practical criteria. The central feature of this methodology is a set of representative loading tasks selected to place demands on primary information processing resources of the operator. Results are reported from an initial evaluation study in which a subset of these standardized tasks were employed to assess the characteristics of a behavioral workload measure.

Author

01 HUMAN FACTORS AND PERSONNEL ISSUES

A84-31212

A STUDY OF TEMPORARY TASK TEAMS

C. P. HELMS (Teledyne Brown Engineering Co., Huntsville, AL) and R. M. WYSKIDA (Alabama, University, Huntsville, AL) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, May 1984, p. 55-60. refs

The formation of temporary task teams necessary to solve complex technical problems is analyzed via a questionnaire. Responses were acquired from 125 high technology individuals who had participated in temporary task teams. The questionnaire data was analyzed utilizing the Chi-square approximation statistic. Results indicate that the task team which develops team spirit early in the task team lifetime is more likely to produce a high quality result. There is a strong indication that the leaders' instructions play a significant role in developing this team spirit.

Author

A84-32353

SIGNIFICANCE OF ALLOWING FOR INDIVIDUAL DIFFERENCES IN ORGANIZING THE WORK SHIFT IN MONOTONOUS PRODUCTION WORK [O ZNACHIMOSTI UCHETA INDIVIDUAL'NYKH RAZLICHII PRI RASSTANOVKE RABOCHEI SMENY NA MONOTONIZIROVANNYKH PROIZVODSTVAKH]

N. P. FETISKIN and V. I. MOLODTSOVA Psikhologicheskii Zhurnal, vol. 4, Sept.-Oct. 1983, p. 101-110. In Russian. refs

A84-41555

PSYCHOLOGY AND THE STUDY OF 'HUMAN FACTORS' IN MANAGEMENT [PSIKHLOGIYA I IZUCHENIE 'CHELOVECHESKOGO FAKTORA' V UPRAVLENII]

A. V. FILIPPOV (Moskovskii Institut Upravleniia, Moscow, USSR) Psikhologicheskii Zhurnal (ISSN 0033-2941), vol. 5, Jan.-Feb. 1984, p. 35-44. In Russian. refs

N84-12713# Committee on Science and Technology (U. S. House).

BIOLOGICAL CLOCKS AND SHIFT WORK SCHEDULING

Washington GPO 1983 411 p refs Hearings before the Subcomm. on Invest. and Oversight of the Comm. on Sci. and Technol., 98th Congr., 1st Sess., no. 7, 23-24 Mar. 1983 (GPO-21-747) Avail: Subcommittee on Investigations and Oversight

A variety of problems which hold consequences for labor, management, and the general public result for shift work scheduling that is not based on research in circadian rhythm. Representatives of airline pilots, nurses, police, factory workers, and nuclear power plant operators delineate the physiological, psychological, and social effects of rotating shifts. Pilot fatigue and desynchronization as factors in aircraft accidents is examined as well as management efforts to address problems of biological rhythms and shift work scheduling.

A.R.H.

N84-13013# California Univ., Livermore. Lawrence Livermore Lab.

REVITALIZATION: AN ORGANIZATIONAL PROGRAM FOR THE INDIVIDUAL

J. M. BREWER Jul. 1983 6 p Presented at the Organizational Develop. Conf., Pasadena, Calif., 11 Oct. 1983 (Contract W-7405-ENG-48)

(DE83-014949; UCRL-89432; CONF-831096-1) Avail: NTIS HC A02/MF A01

Progressive devitalization is a malady that afflicts many workers resulting in tremendous costs to organizations. This malady has long been recognized by management but little has been done to treat it. A new approach to the problem has been instituted at Lawrence Livermore National Laboratory, in the form of a group program called Revitalization. Early results have been very encouraging. The program will continue to be designed and improved in the hope of bringing more productivity to the organization and self-esteem to the individual.

DOE

N84-14683# Army Research Inst. for the Behavioral and Social Sciences, Alexandria, Va.

TRAINING FEEDBACK HANDBOOK Final Report, Sep. 1982 - Jan. 1983

B. L. BURNSIDE, B. G. WITMER, and D. M. KRISTIANSEN Jan. 1983 87 p

(Contract DA PROJ. 2Q2-63743-A-794)

(AD-A132565; ARI-RP-83-7) Avail: NTIS HCA05/MFA01 CSCI 051

This handbook is designed to assist training developers and evaluators in structuring their collection of feedback. Six methods of collecting feedback are described, and practical guidelines for their application are offered. Issues in the management and analysis of feedback are also discussed.

Author (GRA)

N84-14713# Navy Personnel Research and Development Center, San Diego, Calif.

METHODS FOR IMPROVING THE USER-COMPUTER INTERFACE Progress Report, Feb. 1981 - Dec. 1982

P. H. MCCANN Aug. 1983 21 p

(Contract SF57525001)

(AD-A132657; NPRDC-TR-83-29; REPT-17-83-8) Avail: NTIS HCA02/MFA01 CSCI 05H

Numerous examples have been cited of deficiencies in the user-computer interface on Navy computers, both ashore and aboard ship. The computer system designer often overlooks the user's perspective in his desire to provide the user with a system that is a faster and more powerful tool. In this document requirements of the personal computer user are identified and contrasted with computer designer perspectives towards the user. The user's psychological needs are described so that the design of the user-computer interface may be designed to accommodate them. Development of the user-computer interface is discussed in terms of the user's physical, perceptual, and conceptual contacts with the system. The ideals of system design - transparency and visibility to the user - are described. Further research is suggested that will explore the characteristics of efficacious menu selection, develop a theory of the operator, determine the best locus of control for dialogue features, provide guidelines for improving system documentation, and improve user work station habitability.

GRA

N84-14795# Los Alamos Scientific Lab., N. Mex. Computer User Services Group.

MODELING THE USER IN INTELLIGENT USER INTERFACES

M. L. STODDARD and R. J. DOUGLASS 1983 9 p refs Presented at the CHI Conf., Cambridge, Mass. 12-15 Dec. 1983

(Contract W-7405-ENG-36)

(DE84-012664; LA-UR-83-1392; CONF-831202-2) Avail: NTIS HC A02/MF A01

A methodology for explicitly defining a model of a program's users and for evaluating the effectiveness of the user interface is presented. The development of an explicit user model will reduce user costs by both reducing the cost of software development and increasing user productivity. The components of the methodology are described, and an example of using the methodology in the development of an expert consultant system is given. The methodology is useful in preliminary design and testing of such interactive software as electronic mail, information retrieval systems, editors, and management information systems.

DOE

N84-15796# Army Training Development Inst., Fort Monroe, Va. **EVALUATION RESULTS FOR THE INTERACTIVE VIDEO COMPETENCY RECOGNITION SYSTEM Final Report, Dec. 1982 - Mar. 1983**

R. AVANT, C. A. JOHNSON, and P. BEST 30 May 1983 114 p

(AD-A133052; TDI-TR-83-4) Avail: NTIS HCA06/MFA01 CSCI 051

The Organizational Effectiveness Center and School (OEC/S) at Ft Ord, CA, has been the training center for the Army's Organizational Effectiveness Consultants since 1975. The effectiveness of such consultants appears to be dependent upon

soft skills interpersonal competencies, rather than specific tasks which are performed. In 1979, OEC/S and the Army Research Institute contracted with McBer and Co. to develop a model of the competencies which distinguish the superior from the average consultant. Eighteen of the 33 competencies identified in the McBer model were considered by OEC/S to be potentially trainable in the course. The success of the training requires an understanding of the competencies and an ability, on the part of the trainers, to recognize if and when the competencies are being demonstrated.

Author (GRA)

N84-16059# University of Southern California, Los Angeles. Center for Effective Organizations.

PERFORMANCE APPRAISAL REVISITED

E. E. LAWLER, III, A. M. MOHRMAN, JR., and S. M. RESNICK Mar. 1983 27 p

(Contract N00014-81-K-0048)

(AD-A132841; G-83-7-(38); TR-11) Avail: NTIS HCA03/MFA01 CSCL 05I

This report examines a series of studies concerned with performance appraisal effectiveness. It identifies those conditions which are associated with effective appraisals and the relationship between such things as pay discussions and performance appraisal effectiveness.

GRA

N84-16066# University of Southern California, Los Angeles. Center for Effective Organizations.

ORGANIZATIONAL OUTCOMES OF CREATIVITY

M. A. VONGLINOW and S. KERR Jun. 1983 21 p

(Contract N00014-81-K-0048)

(AD-A132825; G-83-11-(42); 13) Avail: NTIS HCA02/MFA01 CSCL 05A

It is an assumption not an established fact, that creative individuals and organizations are more productive in terms of commonly used financial and productivity criteria, and once an individual has become creative, the firm will benefit. However, descriptions of the organizational outcomes of this creativity is general and this paper has attempted to determine whether most people have specifics in mind when speaking of these outcomes and the need for creativity in the organization.

Author (GRA)

N84-16067# University of Southern California, Los Angeles. Center for Effective Organizations.

THE DESIGN OF EFFECTIVE REWARD SYSTEMS

E. E. LAWLER, III Apr. 1983 57 p

(Contract N00014-81-K-0048)

(AD-A132859; G-83-8-(39); TR-12) Avail: NTIS HCA04/MFA01 CSCL 05A

Reward systems are one of the most prominent and frequently discussed features of organizations. This chapter will focus on the design choices that are involved in managing a reward system and their relationship to organizational effectiveness rather than on specific pay system technologies. The underlying assumption is that the reward system of an organization can be a key contributor to organizational effectiveness. However, for this to occur careful analysis needs to be made of the role that reward systems can and should play in the strategic plan of the organization.

GRA

N84-16811# Air Force Human Resources Lab., Brooks AFB, Tex.

HUMAN FACTORS PRODUCTS: A ONE-ACT PLAY WITH EPILOGUE Final Technical Paper

W. B. ASKREN Sep. 1983 9 p

(Contract AF PROJ. 1710)

(AD-A133354; AFHRL-TP-83-34) Avail: NTIS HCA02/MFA01 CSCL 05E

This report presents the thesis that the results of human factors research and development should be delivered as discrete products, not merely as a collective technical report. It describes 35 potential products useful for this purpose. Examples of the products are: drawings; handbooks; algorithms; evaluation data; task analysis results; methods; and criteria.

GRA

N84-17842# University of Southern California, Los Angeles. Center for Effective Organizations.

MOTIVATION AND PERFORMANCE APPRAISAL BEHAVIOR

A. M. MOHRMAN, JR. and E. E. LAWLER, III 1981 34 p

(Contract N00014-81-K-0048)

(AD-A134311; G-81-12(19); REPT-14) Avail: NTIS HC A03/MF A01 CSCL 05J

This paper is concerned with what motivates the behavior involved in carrying out performance appraisals (PA) in organizations. Typically, research and theory concerned with motivation has focused on how PA effects the subsequent work behavior of the appraisee; here we will focus on what motivates the PA behaviors themselves. Conducting a PA involves a set of behaviors performed by organizational members. As such, PA behaviors are simply one subset of the total set of role behaviors they perform. Thus, they can be analyzed as any other organizational behavior. PA behavior is a particularly interesting and important type of behavior to study. The particular purposes of PA create contexts that give PA behaviors unique and complex meanings that are worthy of study for what they can teach us about motivation and assessment. In addition, as we come to understand more about the results of certain PA behaviors (such as allowing participation in the process by appraisees) and as we become more concerned with the quality of PA behaviors (e.g., bias in measurement), we also need to be more concerned about what motivates such behaviors so they can be managed. Seeking to manage performance behaviors through PA will come to nought unless these PA behaviors themselves can be managed.

GRA

N84-20181# Virginia Polytechnic Inst. and State Univ., Blacksburg. Computer Science Industrial Engineering/Operations Research.

GENIE: A COMPUTER-BASED TASK FOR EXPERIMENTS IN HUMAN-COMPUTER INTERACTION

T. E. LINDQUIST, R. G. FAINTER, M. T. HAKKINEN, S. R. GUY, and J. F. MAYNARD Oct. 1983 52 p

(Contract N00014-81-K-0143; RR0-4209)

(AD-A137473; CSIE-83-10) Avail: NTIS HC A04/MF A01 CSCL 05H

The results of many human-computer interaction studies are often not generalizable because the task environment in which they are run does not possess characteristics common to other interfaces. In this paper we describe a generalized task environment that is directly applicable to several interesting real-world tasks, and that contains elements appearing in almost every system having a human-computer interface. The environment is implemented through a software system called GENIE (Generic Environment for Interactive Experiments), and is based on controlling the motion of vehicle through three-dimensional space. Aside from providing a task with common characteristics, GENIE's implementation was designed to allow for adaptation to a variety of studies. The user's interface to the system has been constructed in such a way as to minimize the effort necessary for change. The paper first describes the development of the GENIE software system and then presents its structure. The user's view of the system is discussed followed by a presentation of the facilities available to the experimenter. Software components of the system are described from a functional level, and finally, three example experiments that use the system are described.

Author (GRA)

N84-20184# BioTechnology, Inc., Falls Church, Va.

A REVIEW OF MAJOR ISSUES RELATING TO HUMAN-MACHINE INTEGRATION IN THE DEVELOPMENT OF MILITARY SYSTEMS Final Research Note

H. E. PRICE, C. R. SAWYER, and J. S. KIDD Dec. 1983 46 p

(Contract MDA903-81-C-0541; DA PROJ. 2Q1-62722-A-791)

(AD-A136739; ARI-RN-83-51) Avail: NTIS HC A03/MF A01 CSCL 05H

This paper discusses recurrent problems and deficiencies related to the adequate consideration of human factors, manpower, personnel and training issues in the development of military systems. It provides a brief review and a discussion of these issues from a number of differing perspectives of the varied

01 HUMAN FACTORS AND PERSONNEL ISSUES

participants in the development and acquisition community.

Author (GRA)

N84-20185# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.

APPLIED COGNITIVE SCIENCE

E. E. SMITH and A. COLLINS Dec. 1983 41 p

(Contract N00014-81-C-0019; N00014-79-C-0338)

(AD-A136780; BBN-5499; TR-2-ONR) Avail: NTIS HC A03/MF A01 CSDL 05J

One focus of modern cognitive science is the interaction between people and complex systems, such as computer and electronic systems. American society is becoming inundated with more and more complex systems. The skills required to design, operate, and fix these systems have become necessary ones for anyone to function successfully in our society. Teaching people to deal with these systems, and designing the systems so that they are easy for people to use, are important goals for an applied cognitive psychology. In this paper we present a framework for understanding the research in the cognitive sciences on human interaction with systems, and describe some of the best research carried out in this area.

Author (GRA)

N84-20187# Navy Personnel Research and Development Center, San Diego, Calif.

GUIDE TO THE DEVELOPMENT OF A HUMAN FACTORS ENGINEERING DATA RETRIEVAL SYSTEM Interim Report, 1 Oct. 1981 - 30 Sep. 1982

D. MEISTER and R. E. BLANCHARD Nov. 1983 44 p

(Contract F57-526)

(AD-A136918; NPRDC-TR-84-4) Avail: NTIS HC A03/MF A01 CSDL 05E

This report describes the functional specifications for the development of a human factors engineering (HFE) data retrieval system to be used by system acquisition managers, designers, and HFE specialists. The system is organized around the following requirements: system must be responsive to the needs of a variety of users, include data of the type presently available in MIL STD 1472C plus quantitative estimates of human performance, maintenance and logistics data, specifications and standards, and analytical and evaluational techniques, include data from operational Navy sources not presently found in any HFE data base, be formatted in three tracks, with Track 1 consisting of abstracts of individual studies, Track 2 containing data from the same sources but in a highly synthesized form, and Track 3 containing all other ancillary information such as HFE specifications and standards.

GRA

N84-20428# BioTechnology, Inc., Falls Church, Va.

AN INTRODUCTION TO HUMAN FACTORS FOR ENGINEERING MANAGERS: FRAMEWORK FOR A TEACHING UNIT Final Research Note

H. E. PRICE, J. S. KIDD, and C. R. SAWYER Dec. 1983 139 p

(Contract MDA903-81-C-0541; DA PROJ. 2Q1-62722-A-791)

(AD-A135958; ARI-RN-83-50) Avail: NTIS HC A07/MF A01 CSDL 05I

The materials provided in this document represent an attempt to capture and convey in a concise way some of the basic characteristics of human factors work that managers of military system development projects need to know so that such managers can do their jobs more effectively. A framework is presented that can be used in the planning and presentation of a short course or workshop, or that can be used as a unit in a sustained program of instruction.

GRA

N84-21104# Human Engineering Labs., Aberdeen Proving Ground, Md.

HUMAN ENGINEERING GUIDELINES FOR MANAGEMENT INFORMATION SYSTEMS. CHANGE 1

D. E. HENDRICKS, P. W. KILDUFF, P. BROOKS, R. MARSHAK, and B. DOYLE 9 Jun. 1983 164 p

(AD-A137808; AD-E900298) Avail: NTIS HC A08/MF A01 CSDL 05E

These guidelines are intended to be an aid for the inclusion of human factors considerations in the design of Management Information Systems (MIS). The US Army Material Development and Readiness Command (DARCOM) is faced with a problem of continuing growth in workload combined with constrained or decreasing numbers of personnel. Like many other corporate entities, DARCOM has decided to accelerate the growth of computer utilization in order to increase the productivity of the workforce. In addition to increased computer utilization, there is emphasis toward distributive processing. Distributive processing places computer power in the hands of the functional used which allows the user to interact with (manipulate) the data. Unfortunately, empirical evidence indicates that expenditures on computers are not accompanied, necessarily, by the expected rises in productivity. The paper resulting from this research from this research presented selected personnel data relevant to the design of computer systems and problems of human-computer interaction divided into eight areas: the system design process, system downtime, training, input, data manipulation or retrieval, output, the work station, and communication. (Hendricks, D.E., Man/Computer Interaction in DARCOM. A paper presented at the 1980 AMEDD Psychology Symposium at Walter Reed Army Medical Center, Washington, DC, October, 1980.) Appendix A contains a list of three problems. With an overview of systems and user characteristics, the research team combined that information with the results of an extensive literature search to develop these guidelines for inclusion of human factors considerations during system development or system improvement.

GRA

N84-22357# Joint Publications Research Service, Arlington, Va. **CONCERTED EFFORT FOR NATIONWIDE COMPUTER LITERACY**

G. PARIS *In its* East Europe Rept.: Sci. Affairs (JPRS-ESA-84-010) p 1-8 9 Apr. 1984 Transl. into ENGLISH from Koznveveles (Budapest), 17 Feb. 1984 p 10-14

Avail: NTIS HC A03/MF A01

Education in computer science and techniques is outlined. The advantages of computer technology and methods for effective use of the devices available are discussed. It is suggested that the teaching of computer technology must be organized effectively in public education, the teaching of informatics must be developed further in higher education, and computer technology information should be organized. Long range programs to organize this activity are examined.

E.A.K.

N84-23112# Purdue Univ., Lafayette, Ind. Dept. of Psychological Sciences.

PERSONNEL TECHNOLOGY: PERFORMANCE APPRAISAL, A PROCESS APPROACH Final Report, 15 Jun. 1982 - 14 Aug. 1983

J. L. BARNES-FARRELL and D. R. ILGEN Oct. 1983 15 p

(Contract N00014-82-K-0449; RR0-4208)

(AD-A138359; TR-83-5) Avail: NTIS HC A02/MF A01 CSDL 05J

This report briefly outlines research performed under a contract awarded for investigating processes affecting the accuracy of performance appraisals. A general overview of the research is provided, followed by a listing of major topic areas investigated and reference to the research reports that describe the research in detail. An Appendix to the report lists the titles of the technical reports, presentations at professional meetings, and theses or dissertations that resulted from the research.

Author (GRA)

N84-23148*# IBM Federal Systems Div., Houston, Texas.

PROJECTING MANPOWER TO ATTAIN QUALITY

K. Y. RONE /In NASA. Goddard Space Flight Center Proc. of the Eighth Ann. Software Eng. Workshop 55 p 30 Nov. 1983
 Avail: NTIS HC A15/MF A01 CSCL 09B

The resulting model is useful as a projection tool but must be validated in order to be used as an on-going software cost engineering tool. A procedure is developed to facilitate the tracking of model projections and actual data to allow the model to be tuned. Finally, since the model must be used in an environment of overlapping development activities on a progression of software elements in development and maintenance, a manpower allocation model is developed for use in a steady state development/maintenance environment. In these days of soaring software costs it becomes increasingly important to properly manage a software development project. One element of the management task is the projection and tracking of manpower required to perform the task. In addition, since the total cost of the task is directly related to the initial quality built into the software, it becomes a necessity to project the development manpower in a way to attain that quality. An approach to projecting and tracking manpower with quality in mind is described. Author

N84-23292# Office of the Under Secretary of Defense for Research and Engineering, Washington, D. C.

REPORT OF THE DOD-UNIVERSITY FORUM WORKING GROUP ON ENGINEERING AND SCIENCE EDUCATION Final Report

Jul. 1983 83 p

(AD-A138205) Avail: NTIS HC A05/MF A01 CSCL 05I

Long-term U.S. economic growth requires better use of R&D resources and closer interaction of the academic, government, and industrial research communities. The federal government has proposed to increase support for university research as a key means of addressing national needs for new knowledge in fields important to industrial development and for training of technical personnel. But continuing growth in support for basic research depends on how well the science community can agree on what research investments will have the greatest impact in producing new knowledge. The President assigned high priority to strengthening our national base of scientific and technical personnel. That included immediate emphasis on training people and in the areas of science and technology that were likely to have the greatest impact on both industrial growth and national defense. The needs of the Department of Defense for trained technical personnel, and the current capabilities of the university community for producing an adequate supply of qualified engineers and scientists, is the subject of this report of the DoD-University Forum Working Group on Engineering and Science Education.

GRA

N84-23307# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

ASSESSING CONTRACTING WORKFORCE REQUIREMENTS IN THE MATRIXED ORGANIZATION Final Report

A. J. GOEBEL, C. W. KIPP, and R. M. SEE /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 83-87 1983

(AD-P002760) Avail: NTIS HC A24/MF A01 CSCL 15E

Aeronautical Systems Division (ASD), within the Deputy for Contracting and Manufacturing, on Air Force Systems Command, we believe our most critical resource to be people. Therefore, how we allocate this workforce becomes a primary ingredient to the success of our mission. The purpose of this paper is to explain how contracting personnel are managed and allocated within our matrix organization. We intend to show you how we started; our growing pains in developing a model for evaluating workload; the results of our efforts and finally, our plans for future improvements. Author (GRA)

N84-23310# Air Force Space Div., Los Angeles, Calif.

PREREQUISITES FOR THE ESTABLISHMENT OF A PROFESSIONAL ACQUISITION WORKFORCE Final Report

J. D. KRIEGER /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 95-98 1983

(AD-P002763) Avail: NTIS HC A24/MF A01 CSCL 15E

Government, Industry, and Academe can make and are making great strides toward establishing a professional acquisition workforce. Prerequisite to achieving that goal is that each component do everything it can individually as well as collectively. Presently, there are tremendous barriers to establishing a professional work force and an additional danger of losing ground already gained. Too much is made of some gains that on the surface appear significant. However, by working together the goal of a professional workforce can be achieved, but failing to work together will keep it beyond grasp. Author (GRA)

N84-23311# Army Armament Munitions and Chemical Command, Rock Island, Ill.

TRAINING REQUIREMENTS FOR CHANGING TIMES Final Report

G. T. NIKOLAS /In AF Business Research Management Center Proc. of the Fed. Acquisition with Theme p 99-104 1983

(AD-P002764) Avail: NTIS HC A24/MF A01 CSCL 15E

Federal Managers in the procurement career series have become concerned that there appears to be a need to increase the skill level in career field. The Office of Personnel Management has demonstrated a perception of the procurement career field, as less professional and more administrative in nature, by their efforts in revising the job standards. This perception and current events highlight the subject matter of this paper. The author utilizes data researched from the Federal Acquisition Institute on the educational level of the Government procurement careerist to arrive at his conclusions. The statistical data is supplemented by discussions conducted with industry and Government leaders during recent National Contract Management Association (NCMA) meetings and symposiums. The author makes certain recommendations to improve the overall development of the procurement career professionals. Author (GRA)

N84-23312# Dayton Univ., Ohio.

A DYNAMIC PERSONNEL ASSIGNMENT MODEL IN THE R AND D ENVIRONMENT Final Report

P. J. SWEENEY /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 105-107 1983

(AD-P002765) Avail: NTIS HC A24/MF A01 CSCL 05A

This computer simulation captures the contributions of inexperienced and experienced personnel to overall effectiveness in a typical research and development organization. The model is appropriately responsive to changes in experience, level, Systems Program Office (SPO) leadership, priority, funding, and other factors. Given a fixed number of total personnel authorizations and fixed percentage of inexperienced personnel, the model indicates that assigning the inexperienced to the lower priority SPOs results in a maximum organizational measure of effectiveness (MOE). It also shows that an assignment policy based upon both priority and funding level may have only small impact upon this high MOE. Similarly, assigning all of the inexperienced to the high priority SPOs results in a relatively low MOE. Improving the SPO leadership increases the value of the MOE, but cannot compensate for high percentages of inexperience. The model can also be used to assign SPO leaders. Author (GRA)

01 HUMAN FACTORS AND PERSONNEL ISSUES

N84-23313# Oklahoma City Air Logistics Center, Tinker AFB, Okla.

TRAINING ACQUISITION PERSONNEL THROUGH A LOCAL COLLEGE Final Report

E. R. WATTERS and H. A. MAIN *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 108-110 1983

(AD-P002766) Avail: NTIS HC A24/MF A01 CSCL 15E

There are two important keys to effective and cost conscious acquisition of goods and services for the Air Force: The first is a work force trained in current acquisition skills; the second is a reservoir of qualified people for entry into the acquisition career field. To enlarge the pool of qualified people and to provide training opportunities for people in the career field, our Directorate initiated action to establish an Associate Degree Program in Purchasing and Contracting at Oscar Rose Junior College. The program is now in being and a number of our people, both clerical and professional, are attending classes offered through this program.

Author (GRA)

N84-23393# Joint Publications Research Service, Arlington, Va. **RESEARCH IN MAN-MACHINE INTERACTION DISCUSSED**

D. BALAGEZYAN *In its* USSR Rept.: Sci. and Technol. Policy (JPRS-UST-84-007) p 64-66 28 Feb. 1984 Transl. into ENGLISH from Kommunist (USSR), 20 Sep. 1983 p 2

Avail: NTIS HC A05

Research in human factors engineering is examined. Emphasis is placed on labor management and productivity and how they relate to various man/machine systems. An overview of the current research is included. M.A.C.

N84-24098# Washington Univ., Seattle. Dept. of Psychology. **SOCIAL SUPPORT AND PERFORMANCE IN COMPLEX ORGANIZATIONS Final Report, 1 Jun. 1980 - 31 Dec. 1983**

I. G. SARASON 30 Jan. 1984 25 p

(Contract N00014-80-C-0522)

(AD-A138888; CO-ONR-010) Avail: NTIS HC A02/MF A01 CSCL 05K

This is the Final Report of a research project carried out between June 1, 1980 and December 31, 1983. Nine technical reports and fourteen articles resulted from the project. The research dealt with social support, its assessment, relationship to performance, and stability over time. The findings showed that social support is related to performance, interpersonal skills and relationships in a complex organization. Social support provided in a performance situation was found to be especially helpful for individuals who perceived low levels of support in their personal lives. Author (GRA)

N84-25277# Committee on Science and Technology (U. S. House).

BIOLOGICAL CLOCKS AND SHIFT WORK SCHEDULING

Washington GPO 1984 44 p refs Presented by the Subcomm. on Invest. and Oversight to the Comm. on Sci. and Technol., 98th Congr., 2d Sess., Jan. 1984

(GPO-29-312) Avail: Subcommittee on Investigations and Oversight

The current status of research on the effects of rotating shift work on human performance is examined. A brief survey on circadian rhythms and the problems experienced by workers on rotating shifts is presented. Suggestions for work schedules that minimize some of the problems such as insomnia, chronic fatigue, physiological ailments, and reduced alertness are included with provisions for management training in the understanding of biological clocks. M.A.C.

N84-25524# Argonne National Lab., Ill. Computing Services Div.

GUIDE TO REPORTING TIME IN THE FINANCIAL INFORMATION SYSTEM AT ANL

M. E. BRETSCHER, J. L. BUTLER, and L. J. SKELLEY Mar. 1984 58 p

(Contract W-31-109-ENG-38)

(DE84-009356; ANL/TM-414) Avail: NTIS HC A04/MF A01

Operation of a new system for the full cost recovery service centers of the Laboratory report employee time, whether the time is charged to another organization or to an internal function are described. Most service centers of the laboratory report employee time to the financial information system (FIS) via time cards or timesheets, which are routed to the Data Entry group of the administrative data processing operation where the time records are keyed. With this new system, the service center assumes primary responsibility for the keying and management of time charges. The system provides these benefits to the service center: a choice of processing period and month end boundary, printed timesheets with history of charges by employee, prevalidation of charges, thus fewer rejected charges, and computer readable file of current and prior charges for analysis. The controller's office plans to implement the time reporting system on a division by division basis until most service centers assume responsibility for their time charges. DOE

N84-26303# Army Test and Evaluation Command, Aberdeen Proving Ground, Md.

HUMAN FACTORS ENGINEERING. PART 2: HEDGE (HUMAN FACTORS ENGINEERING DATA GUIDE FOR EVALUATION)

30 Nov. 1983 397 p

(AD-A140391; TOP-1-2-610-PT-2) Avail: NTIS HC A17/MF A01 CSCL 05E

The purpose of the information in HEDGE is to expand test capabilities in considering the human element. It will provide a strategy for viewing an item which is undergoing testing from the standpoint of the soldier who must ultimately operate, maintain, or otherwise utilize it. The use of these materials, in addition to standard Task and Design Checklists and Questionnaires, will tailor HFE subtest to a specific item. These materials are intended to support test engineers not design engineers. They were designed with specific tasks in mind, i.e., preparing a Test Plan, conducting a test, analyzing and interpreting test data, and generating the test report. They were prepared under the cognizance of the TECOM Human Factors Engineering Directorate. GRA

N84-26710# Army Research Inst. for the Behavioral and Social Sciences, Alexandria, Va.

RESEARCH ISSUES IN TRAINING DEVICE DESIGN: THE ORGANIZATION OF A DATA BASE Final Report

R. T. HAYS and M. J. SINGER Sep. 1983 75 p

(Contract DA PROJ. 2Q2-62722-A-795)

(AD-A140815; ARI-TR-588) Avail: NTIS HC A04/MF A01 CSCL 05I

This paper is an accumulation and categorization of training systems research issues which are critical in making training device design decisions. The training system research issues are organized around an Instructional Systems Development (ISD) type framework, and the research literature on these issues is reviewed. A means for accumulating new and existing data as well as accessing the empirically derived information and generating training device design guidance is proposed. Author (GRA)

N84-27441 Claremont Graduate School, Calif.

MOTIVATION AND WORK PERFORMANCE: A COMPARATIVE AND ANALYTICAL STUDY Ph.D. Thesis

P. GHANOUNI 1984 259 p

Avail: Univ. Microfilms Order No. DA8407453

The topic of motivation and work performance in organizations has received increased attention in recent years among practicing managers and organizational researchers. Several major theories of motivation and related organizational factors were analyzed in a comparative fashion, and then integrated with research and

practical applications. The implications of managerial practice in dealing with motivation in organizational settings were considered. In the course of four major discussions, motivation was defined and its importance to organizations was stressed. Motivation theories were reviewed, and the managerial applications suggested by these theories were discussed. The relationship of motivation to the broader concerns of organizational behavior was emphasized. Knowledge concerning the role of motivation in an organizational setting was reviewed, analyzed and compared.

Dissert. Abstr.

N84-27584 Indiana Univ., Bloomington.

THE EFFECTS OF TASK VARIABILITY, SENSORY REINFORCEMENT, AND MONETARY REINFORCEMENT ON PERFORMANCE, SATISFACTION, AND INTRINSIC MOTIVATION Ph.D. Thesis

J. L. FARH 1983 167 p

Avail: Univ. Microfilms Order No. DA8406793

While it was recognized that task performance and self reports of satisfaction are a function of the manner in which the task is designed, few researchers have demonstrated the effects of task design on task behavior through systematic manipulation of task properties. Two important task properties - task variability and sensory reinforcement - were systematically varied, and their effects on task behavior under various monetary reward contingencies were examined. The results showed that both task variability and sensory reinforcement increased satisfaction and intrinsic motivation. The offer of monetary rewards, however, did not have an effect on satisfaction or intrinsic motivation. Moreover, it was found that the piece-rate subjects performed at a higher rate than the unexpected reward subjects. In addition, sensory reinforcement was found to decrease performance in early trials. Finally, the performance satisfaction relationship was found to be moderated by task variability as well as sensory reinforcement. The results are discussed in terms of their relevance for task design as well as current theories of job motivation.

Dissert. Abs't.

N84-28410# Colorado Univ., Colorado Springs.

SITUATIONAL INTERACTION: A PEER COUNSELING APPROACH TO AWOL (UNAUTHORIZED ABSENCES FROM DUTY) REDUCTION

R. L. DURHAM and C. EMILIO /In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 35-39 Apr. 1984

(AD-P003243) Avail: NTIS HC A99/MF A01 CSCL 05J

An AWOL reduction program, which utilized peer counseling, was conducted with two randomly selected companies from a mechanized infantry battalion at Fort Carson, Colorado. Two randomly selected companies from the same brigade served as static control units. Employing the Taylor-Johnson Temperament Analysis (T-JTA), AWOL-prone soldiers were identified and were counseled initially by the unit chaplain and subsequently by platoon leaders. Platoon leaders identified situational aspects of AWOL-prone soldiers and interacted as mediators between environmental situations (e.g., money problems) and personal factors identified by the T-JTA. As a function of the intervention, the treated group showed a significant decline in AWOL rates while the control group did not. Results were discussed in terms of the efficiency of employing the Taylor-Johnson Temperament Analysis in conjunction with peer counseling to reduce AWOL rates.

GRA

N84-28411# Air Force Academy, Colo.

EVALUATION OF THE BCT (BASIC CADET TRAINING) PARAPROFESSIONAL COUNSELOR TRAINING AT THE UNITED STATES AIR FORCE ACADEMY

P. R. BROWN and J. L. RAY /In its Proc. of the 9th Symp. on Psychol. in the DOD p 40-44 Apr. 1984

(AD-P003244) Avail: NTIS HC A99/MF A01 CSCL 05J

This study evaluated the competence of USAF Academy paraprofessional counselors in communicating a helpful response to assess the success of counselor training. The purpose of this study was to evaluate, by objectively measuring counseling ability, training for paraprofessional counselors who worked as cadre in

Basic Cadet Training (BCT) at the United States Air Force Academy. BCT is a six-week training program for cadets entering the Academy, designed to provide military instruction and experience to transition the basic cadet from civilian to military life and provide a foundation for future military development. To meet the individual-specific needs caused by the strenuous environment, the USAF Academy uses upperclass cadets as paraprofessional counselors to the basic cadets.

GRA

N84-28424# Washington Univ., Seattle.

PHYSICAL PERFORMANCE TESTS AS PREDICTORS OF TASK PERFORMANCE

T. L. DOOLITTLE, O. L. SPURLIN, and M. P. SCONTRINO /In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 105-109 Apr. 1984

(AD-P003257) Avail: NTIS HC A99/MF A01 CSCL 05J

The more arduous the task, the greater the intensity of force which must be applied per unit of time to overcome resistance or achieve rate. Intensity is commonly called workload with magnitude expressed in appropriate units of power. Two complex factors determine the limits for which an individual can produce energy and generate the requisite power: (1) capacity to utilize oxygen, and (2) ability to generate muscular tension. The former is called aerobic power and the latter strength. From the foregoing discussion it can be seen that it is impossible to replicate the significant components of physically demanding occupations. If a test can be demonstrated to represent important job components it is valid to use the test in applications such as preemployment screening. Nevertheless, because of the legal guidelines and changing professional standards surrounding test validation, there are some important issues to consider in order to firmly establish the defensibility of a physical performance test.

GRA

N84-28425# Colorado Univ., Denver.

AFFECTIVE DETERMINANTS OF JOB PERCEPTIONS

K. KRAIGER /In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 112-116 Apr. 1984

(AD-P003258) Avail: NTIS HC A99/MF A01 CSCL 05J

The Job Characteristics Model of Hackman and Oldham (1976) has served as a useful guide for designing jobs to be more motivating and satisfying. It is argued, however, that the job perceptions of incumbents may be biased or influenced by internal affective states or moods. This assertion is supported by the results of two studies. The first was a laboratory study in which job perceptions were more favorable when subjects were artificially placed in a good mood. In the second study, the overall job perceptions of a sample of city government workers were found to be predictable from both their job satisfaction and mood states.

Author (GRA)

N84-28447# Air Force Hospital, Lackland AFB, Tex.

PSYCHOLOGICAL AND BIOCHEMICAL EFFECTS OF A STRESS MANAGEMENT PROGRAM

T. CAYTON, J. C. PATTERSON, W. PIERSON, and G. TROXLER /In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 323-327 Apr. 1984

(AD-P003300) Avail: NTIS HC A99/MF A01 CSCL 05J

The present study is the first of a series of investigations to assess the effects of stress management on selected psychological and biochemical risk factors for cardiovascular disease. We wanted to sample emotional, behavioral, physical and biochemical measures which might be sensitive to the changes of an effective stress management program.

GRA

01 HUMAN FACTORS AND PERSONNEL ISSUES

N84-28451# Defense Technical Information Center, San Diego, Calif. MATRIS Office.

PROTOTYPE DEVELOPMENT OF AN INFORMATION-SHARING AND DECISION SUPPORT SYSTEM FOR THE MANPOWER PERSONNEL AND TRAINING COMMUNITY

J. OXMAN, L. RICHARDS, and L. LOUGHNANE /in AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 371-375 Apr. 1984

(AD-P003310) Avail: NTIS HC A99/MF A01 CSCL 05A

The availability of up-to-date and reliable data on the substance and funding of Research and Development efforts within the Manpower Personnel and Training (MPT) community, and the valid linkage of such data through a systems approach, are important aids to researchers and managers in the Department of Defense. The Manpower and Training Research Information System (MATRIS) is a computerized, information-sharing and Decision Support System (DSS) designed to provide such aids to those involved with the conduct and/or fiscal management of Department-of-Defense-sponsored, people-related Research and Development pursuits. Although already in operation, the evolution of MATRIS continues within the framework of the prototype development model. The prototype development process of MATRIS, the structure and content of its data base, and the services and products which the system makes possible, are described. Author (GRA)

N84-28452# Air Force Academy, Colo.

MANAGEMENT INFORMATION SYSTEMS: A NEED FOR HUMAN FACTORS

J. A. BOYLESS /in its Proc. of the 9th Symp. on Psychol. in the DOD p 385-389 Apr. 1984

(AD-P003313) Avail: NTIS HC A99/MF A01 CSCL 05A

The microcomputer revolution in management information systems now allows almost instant access to millions of bits of information to predict, trend, or even recall past activities. Additionally, the access to this information is now being accomplished by placing the computer on desktops everywhere. Often these computers are user friendly and little or no computerese is needed to operate them. These desktop computers have been human engineered from the software point of view but often the actual human engineering development and evaluation is lacking. This paper takes a general look at the lack of human engineering development and evaluation and suggests items that should be addressed in these two areas. Author (GRA)

N84-28455# Norton AFB Ballistic Missile Office, Calif.

THE STRUCTURE OF PROCESSING RESOURCE DEMANDS IN MONITORING AUTOMATIC SYSTEMS

J. MICALIZZI /in AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 430-434 Apr. 1984

(AD-P003319) Avail: NTIS HC A99/MF A01 CSCL 05H

Human operators are increasingly being called upon to function as monitors of automatic systems. System monitors, as opposed to active controllers, do not necessarily experience lower workload levels during task performance. In fact, prior research has suggested that workload demands may not be reduced but rather shifted to a functionally separate processing pool according to a structure specific view of human attention. Sternberg's additive factors method may provide a useful workload assessment technique for localizing the information processing demands of task performance. The present study couples a primary failure detection task with a secondary Sternberg task which employed a perceptual and response load manipulation. The results demonstrated a significant overlap of processing resources for the failure detection task and the Sternberg perceptual condition. For the response load condition, there was no evidence of shared resources between the two tasks. These results have significant implications for task configuration and workload assessment research. Author (GRA)

N84-28461# Illinois Univ., Champaign. Cognitive Psychophysiology lab.

PSYCHOPHYSIOLOGICAL TOOLS IN ENGINEERING PSYCHOLOGY

E. DONCHIN, A. KRAMER, A. MANE, D. KARIS, and E. HEFFLEY /in AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 542-546 Apr. 1984

(AD-P003337) Avail: NTIS HC A99/MF A01 CSCL 05I

Selective attention is a crucial component of task performance in virtually every man-machine system. Thus, theoretical and practical considerations relating to attention should be a primary focus in several domains within the human engineering of such systems. In the realm of design, a general psychological understanding of attentional capacities and mechanisms should guide the development complex systems. In systems evaluation, limitations in the ability to attend to multiple information sources should be a primary consideration in judging the merits of various prototypes. In the selection of operations personnel for complex systems, individual differences in the ability to selectively attend to relevant information channels can be an important factor in the prediction of future performance. Research on the relation of human event-related brain potentials to selective attention has made contributions to our theoretical understanding of attentional capacities and has yielded several methods for the practical application of ERPs to human engineering problems. GRA

N84-28462# Air Force Human Resources Lab., Brooks AFB, Tex.

INDIVIDUAL DIFFERENCES IN LEARNING RATE

D. L. PAYNE and W. C. TIRRE /in AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 548-552 Apr. 1984

(AD-P003338) Avail: NTIS HC A99/MF A01 CSCL 05A

As part of the Learning Abilities Measurement Program (Project LAMP) we are investigating the use of direct measures of learning rate as predictors of future learning and task performance. It is proposed that direct measures of learning rate collected under controlled laboratory conditions will help us to identify recruits who may score low on conventional tests, but have the potential to catch up with or surpass current high scorers in learning some new occupational skill. Given the present Air Force policy of assigning individuals to an occupational area on the basis of the area's rated learning difficulty, direct measures of learning rate could have great utility for future selection and classification procedures. There are several unresolved issues concerning the use of measures of learning rate as predictors. In this paper we focus upon the use of learning rate as a predictor of the following learning outcomes: school achievement, knowledge retention, and ease of relearning. GRA

N84-28463# Old Dominion Univ., Norfolk, Va.

ASSESSMENT OF LEARNING ABILITIES USING RATE MEASURES

G. L. ALLEN and B. B. MORGAN, JR. /in AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 559-563 Apr. 1984

(Contract F41689-83-C-0016)

(AD-P003340) Avail: NTIS HC A99/MF A01 CSCL 05J

Provided in this presentation is a description of progress in a unique research effort examining the utility of learning rate measures as predictors of learning abilities. Complex Experimental Learning Tasks (CELTs) have been developed in response to the challenge of devising a technology for measuring learning rate. CELTs provide a real-time sample of learning performance on criterion-free, face-valid memory tasks. Microcomputer-based administration affords detailed records of learning activities while facilitating efficient data management. Subjects' performance is described by plotting performance indices (e.g., accuracy, speed of responding) over time. Slope and intercept parameters from these functions hold promise as valid measures of learning rate. Efforts are underway to: (1) determine relationships between traditional aptitude measures and learning rate measures from CELTs, and (2) explore the predictive value of these rate measures for classroom performance. Author (GRA)

N84-28464# Walter Reed Army Medical Center, Washington, D.C.

AGE EFFECTS ON ACTIVE DUTY ARMY MMPI (MINNESOTA MULTIPHASIC PERSONALITY INVENTORY) PROFILES

F. J. FISHBURNE and S. C. PARKISON /in AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 575-579 Apr. 1984 (AD-P003343) Avail: NTIS HC A99/MF A01 CSDL 05J

Age effects on response patterns to the Minnesota Multiphasic Personality Inventory have been recognized by the creation of separate norms for adolescent, adults and aged adults. This study examined the effects of age within a normal Army adult male population on MMPI response pattern. Of the validity and clinical scales only scales L, 3 (Hysteria) and 5 (Masculinity-Femininity) showed no significant age effects. Scale means and percentage of respondents scoring above 70T (non-K-corrected Minnesota Adult Norms) across age groups both showed scale age clusters which substantiate the need for age appropriate norms within the adult Army male population. Author (GRA)

N84-28467# Baltimore Univ., Md.

BEHAVIORAL ISSUES IN THE MANAGEMENT OF TECHNOLOGY

V. LUCHSINGER /in AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 605-609 Apr. 1984 (AD-P003349) Avail: NTIS HC A99/MF A01 CSDL 05J

Considerable discussion today reflects pessimism concerning the effects of technology, and the ability of man to control or manage technology. This paper presents technology as a human activity, capable of being managed. This capability is subject to better understanding and use of human behavior factors involved. The face of technology is usually painted with a mechanistic mien, and pessimistic predictions are made that technology is ruling man in contemporary organizations. This is especially hard in defense organizations and related industrial settings. This paper will look at technology from the management view, and examine some options for improving man's use of technology. Those options will be based on the findings and practice of behavioral science. GRA

N84-28474# Naval Ocean Systems Center, San Diego, Calif.

NOSC (NAVAL OCEAN SYSTEMS CENTER)-HAWAII PERCEPTUAL SCIENCES RESEARCH PROGRAM

R. L. PEPPER /in AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 672-676 Apr. 1984 (AD-P003361) Avail: NTIS HC A99/MF A01 CSDL 05J

The broad objective of our group is to develop an understanding of the dynamic interaction which occurs between the human operator and the sensors, controls, and displays of remotely manned systems (teleoperators). The emphasis is placed on establishing a fundamental understanding of man's perception of information received from sensors and displays and his performance using control systems and their associated manipulator devices, in order to produce increasingly intelligent, skilled performance across a variety of specified tasks. In order to accomplish this objective, we have begun to develop a general model of remote operator performance that will ultimately have broad predictive ability. A fundamental prerequisite for the development of this model is a data base of performance derived both from empirical tests as well as from predictions based on existing models of perception and motor-skill performance. GRA

N84-28480# Army Research Inst. for the Behavioral and Social Sciences, Alexandria, Va.

VIDEO GAMES: A HUMAN FACTORS GUIDE TO VISUAL DISPLAY DESIGN AND INSTRUCTIONAL SYSTEM DESIGN

D. J. BOBKO /in AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 712-716 Apr. 1984 (AD-P003368) Avail: NTIS HC A99/MF A01 CSDL 05I

Electronic video games have many of the same technological and psychological characteristics that are found in military computer-based systems. For this reason, the video game is both a fascinating object of study and a valuable experimental apparatus. The results of two on-going research programs, both of which

employ video games as experimental stimuli, are presented here. The first research program seeks to identify and exploit the characteristics of video games in the design of game-based training devices. The second program is designed to explore the effects of electronic video display characteristics on perceptual judgments. The empirical results of these two programs are shown to have practical application in training device design and visual display design. Author (GRA)

N84-28485*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

EVALUATION OF THE HARDMAN COMPARABILITY METHODOLOGY FOR MANPOWER, PERSONNEL AND TRAINING

W. ZIMMERMAN, R. BUTLER, V. GRAY, and L. ROSENBERG 29 Feb. 1984 182 p refs (Contract NAS7-918)

(NASA-CR-173733; JPL-PUBL-84-10; NAS 1.26:173733;

ARI-13AR119; ARI-13AR183-35) Avail: NTIS HC A09/MF A01 CSDL 05H

The methodology evaluation and recommendation are part of an effort to improve Hardware versus Manpower (HARDMAN) methodology for projecting manpower, personnel, and training (MPT) to support new acquisition. Several different validity tests are employed to evaluate the methodology. The methodology conforms fairly well with both the MPT user needs and other accepted manpower modeling techniques. Audits of three completed HARDMAN applications reveal only a small number of potential problem areas compared to the total number of issues investigated. The reliability study results conform well with the problem areas uncovered through the audits. The results of the accuracy studies suggest that the manpower life-cycle cost component is only marginally sensitive to changes in other related cost variables. Even with some minor problems, the methodology seem sound and has good near term utility to the Army. Recommendations are provided to firm up the problem areas revealed through the evaluation. M.A.C.

N84-29480# Illinois Univ., Urbana. Engineering-Psychology Research Lab.

A MULTIPLE PROCESSING RESOURCE EXPLANATION OF THE SUBJECTIVE DIMENSIONS OF OPERATOR WORKLOAD

W. L. DERRICK and C. D. WICKENS Feb. 1984 93 p

(Contract N00014-79-C-0658)

(AD-A141455; EPL-84-2/ONR-84-1) Avail: NTIS HC A05/MF A01 CSDL 05H

Multiple measures of operator workload may dissociate, or fail to agree, for a given task. The goal of this study was to determine which task difficulty (workload) as indexed by attentional resource demand could explain the attendant variance in a second index of workload, subjective ratings. A multiple resource model of processing resources (Wickens, 1980) guided construction of tasks of differential resource demand. These tasks were both performed by subjects and rated according to workload similarity. Scaling and clustering analyses of the similarity data produced subjective dimensions/clusters of workload that were explained in terms of resource demand, task structure, and task characteristics. Data collected to support this analysis - task performance, physiological measures of heart period variability, effort ratings - revealed three primary dissociations. These dissociations were explained by using the parameters of Wickens' multiple resource theory. GRA

N84-29792# New South Wales Univ., Sydney (Australia).

THE IMPACT OF A COMPUTERIZED NETWORK ON THE QUALITY OF WORK LIFE IN TWO COLLEGE OF ADVANCED EDUCATION LIBRARIES IN NEW SOUTH WALES N.S. Thesis

M. COFFEY 1982 160 p refs

Avail: NTIS HC A08/MF A01

The objective was to gather preliminary data on the impact of a computerized network (CLANN Limited) on the quality of work life of library staff in two college libraries. The expectations of the study were that network membership would affect the level of autonomous decision-making, the organizational structure, and the

01 HUMAN FACTORS AND PERSONNEL ISSUES

type and number of cataloguing staff required. Furthermore, the existing organizational climate and the method of implementing the technology were expected to be significant factors in the quality of the work experience. The case study method was selected. Data was gathered by way of semi-structured interviews with staff at all organizational levels of the two libraries, and with the CLANN office staff. The case studies confined the potential of the technology to influence the factors described above. However, the mission of the library and its management philosophy emerged as more significant than the technology. R.J.F.

N84-30768# Softech, Inc., Waltham, Mass.
ADA (REGISTERED TRADEMARK) TRAINING CURRICULUM.
ADA (REGISTERED TRADEMARK) FOR SOFTWARE
MANAGERS, L201. TEACHERS' GUIDE: VOLUME 1
May 1984 245 p 2 Vol.
(Contract DAAB07-83-C-K514)
(AD-A142430) Avail: NTIS HC A11/MF A01 CSCL 051

Course outline for the 3 days. Section 1, is a refresher on a basic Ada system; sections 2-16 present each Ada feature in greater detail with short exercises interspersed; section 17, then uses this Ada knowledge in a larger exercise aimed at Ada design and code assessment; section 18, formalizes the discoveries of section 17; and section 19, summarizes the entire course by putting Ada into its primary design purpose: more reusable and portable software. GRA

N84-30769# Softech, Inc., Waltham, Mass.
ADA (REGISTERED TRADEMARK) TRAINING CURRICULUM.
ADA (REGISTERED TRADEMARK) FOR SOFTWARE
MANAGERS, L201. TEACHERS GUIDE: VOLUME 2
May 1984 314 p 2 Vol.
(Contract DAAB07-83-C-K514)
(AD-A142431) Avail: NTIS HC A14/MF A01 CSCL 051

The training curriculum for Ada is described and directed towards the instruction of software managers. Topics include Tasks; Generics; Input/output; Exceptions; Stubbing; Visibility and Scope; Overloading; Pragmas; Low-Level Features; and Summary of Uses of Ada Features. M.A.C.

N84-30770# Softech, Inc., Waltham, Mass.
ADA (REGISTERED TRADEMARK) TRAINING CURRICULUM.
SOFTWARE ENGINEERING FOR MANAGERS. M101:
TEACHERS GUIDE
May 1984 355 p
(Contract DAAB07-83-C-K514)
(AD-A142432) Avail: NTIS HC A16/MF A01 CSCL 051

The training curriculum for the improvement of software through optimized software engineering is presented. Topics include Background; Software Engineering and Its Goals; Achieving Software Engineering Goals; and Software Engineering and Ada. M.A.C.

N84-31164# Softech, Inc., Waltham, Mass.
ADA (TRADEMARK) TRAINING CONSIDERATIONS
C. L. BRAUN *In* ASD Proc. Papers of the 2nd AFSC Avionics Standardization Conf., Vol. 1 p 545-559 Nov. 1982
(Contract DAAK80-81-C-0187)
(AD-P003560) Avail: NTIS HC A25/MF A01 CSCL 051

The government has instituted the Ada program with the objective of reducing its rapidly-increasing software development costs. Ada will do this by providing programmers with modern capabilities that have been demonstrated to promote more cost-effective software development. Clearly, the government's objective can be met only if programmers actually learn to use these capabilities effectively. This requires significant change from the way they are used to working, and poses a massive retraining requirement. SofTech has been working with the U.S. Army to assess the training needs of various segments of the industry and government work forces, to identify training issues and effective techniques for addressing them, and to recommend a training approach. This effort has resulted in development of a complete recommended Ada curriculum. The curriculum provides training in

the Ada language, the environment, and modern development methodologies. It consists of a set of modular building blocks that can be configured to meet varying individual or organizational needs, adapted to different organizations' practices, and packaged to meet scheduling needs. This approach answers many of the difficult questions that have been asked about Ada training, and presents a realistic roadmap to widespread industry competence in Ada. Author (GRA)

N84-31920# Joint Publications Research Service, Arlington, Va.
REALIZATION OF HUMAN WORK CAPACITY:
INTERDISCIPLINARY PROBLEMS Abstract Only
B. S. MARYENKO, K. R. KOPYSTYANSKAYA, and N. A. TITOVA
In its USSR Rept.: Life Sci. Biomed and Behavioral Sci. (JPRS-UBB-84-012) p 31 6 Jun. 1984 Transl. into ENGLISH from Visn. Akad. Nauk Ukr. RSR (Kiev), no. 1, Jan. 1984 p 25-33
Avail: NTIS HC A05/MF A01

Approaches to utilization of human work capacity are discussed from a psychophysiological and organizational point of view. In addition to relying on physiological and psychological testing of applicants for a position to determine their suitability, factors such as creating favorable work environments and rational work assignment and management are important. Optimum production and productivity can only be expected when all the factors pertinent to a given work situation are scientifically analyzed and evaluated. This also implies the need for periodic reassessment of both the health and attitudes of the workers, and of the changing job requirements. E.A.K.

N84-32231# Boeing Military Airplane Development, Wichita, Kans.
CONCURRENCY OF DESIGN CRITERIA: A KEY TO TRAINER READINESS
J. CASPERSON and J. JONAS *In* American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 60-63 16 Nov. 1983
(AD-P003454) Avail: NTIS HC A17/MF A01 CSCL 051

The benefits associated with combat crew readiness are obvious. What may not be so obvious are the benefits associated with timely acquisition and availability of training and training devices. As new aircraft programs develop and present aircraft programs mature, the crews must either train on the operational equipment or wait until the associated trainers are developed or updated. If the trainers are developed and updated in concert with the aircraft program, the Air Force is provided not only with combat-ready crews at the correct time, but also at the correct cost. The key to keeping the training devices in concert with the aircraft is Concurrency Program. On the B-1B program, a complete concurrency program is being addressed. By complete, it is meant a program which addresses the two major issues associated with keeping the trainer concurrent with the aircraft. (1) Cost-effective development and distribution of the required design criteria data. (2) Inherent flexibility designed into the training device to accommodate changes in a cost-effective manner. Author (GRA)

N84-32232# Honeywell, Inc., West Covina, Calif.
DETERMINING COST AND TRAINING EFFECTIVENESS
TRADEOFFS FOR TRAINER DESIGN: TEST OF AN
EXPERIMENTAL MODEL
R. A. WIENCLAW and J. ORLANSKY (IDA, Alexandria, Va.) *In* American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 64-73 16 Nov. 1983
(AD-P003455) Avail: NTIS HC A17/MF A01 CSCL 05A

This paper reports the status of an ongoing project to develop a macro model describing the decisions involved in developing training equipment. The purpose of the model is to assist managers in making such decisions by providing information concerning the tradeoffs between the cost and effectiveness of training provided by different configurations and choices of equipment. The goals of the current phase of the study were to determine the feasibility

of collecting data to empirically test the model and turn it into a practical tool to be used in making decisions relating to trainer design and development, and to perform a preliminary test of the model. Results of the field data collection led to the conclusion that the data necessary to test the model can be obtained. However, such measures need to be refined before the model can be turned into a practical tool. The preliminary test of the model performed in this study resulted in no major modifications of the model.
Author (GRA)

N84-32234# Air Force Human Resources Lab., Williams AFB, Ariz.

TRAINING CAPABILITIES: THE FACILITY PART OF THE EQUATION

J. S. KAMCHI and W. DUBE / In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 84-91 16 Nov. 1983

(AD-P003457) Avail: NTIS HC A17/MF A01 CSCL 13M

The theme of increased readiness through training has an inherent assumption that adequate facilities either exist, can be modified, or can be built to house computerized training devices. Too often adequate facilities do not exist or require long lead times to acquire. Training capabilities can become a myth to the realities of not having an adequate facility or of having modern training equipment fail because of facility deficiencies such as high temperatures and power spikes. But what are adequate facilities for computerized training devices, and how do we acquire them? This paper will review the time phasing and types of funding available within the Department of Defense for construction projects, design concepts of a flexible modular training building including security and environmental considerations. Without understanding the time phasing for acquisition of training facilities, the effectiveness of training devices can be reduced to zero.

Author (GRA)

N84-32241# AAI Corp., Baltimore, Md.

MANAGING A LOW QUANTITY, HIGH TECHNOLOGY TRAINER DEVELOPMENT PROGRAM

L. J. RYTTER / In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 123-126 16 Nov. 1983

(AD-P003464) Avail: NTIS HC A17/MF A01 CSCL 05A

To effectively manage a low quantity, high technology trainer development program, the program management team must consider a variety of trade-offs during the development cycle. These trade-offs stem from the fact that a limited production trainer is neither a prototype nor a production line unit. This paper presents the issues and trade-offs which should be addressed by the program management team prior to and during the trainer development program.

Author (GRA)

N84-32260# Veda, Inc., Dayton, Ohio,

SOME MANAGEMENT INITIATIVES TO IMPROVE EMBEDDED COMMERCIAL COMPUTER AND TRAINING DEVICE LIFE CYCLE SUPPORT

W. W. GAMBLE / In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 343-349 16 Nov. 1983

(AD-P003494) Avail: NTIS HC A17/MF A01 CSCL 05A

This paper discusses some of the problems associated with the use of commercial off-the-shelf computer systems in aircrew training devices and offers some suggestions for improving the life cycle management of commercial computer systems in such military training devices. The impacts of commercial practices and computer capacity limitations are addressed as well as acquisition and logistics management considerations. Improved planning and management effectiveness will be needed in the 1980s to ensure that computer systems are supportable and/or replaced during the life cycle of training devices systems. Both acquisition and logistics support agencies will need to recognize that the life cycle of commercial computer systems may be limited by the lack of computer and peripheral vendor support and by the lack of expansion capability. Accordingly, training devices will need to be

designed and developed to accommodate computer expansion or replacement. Computer system expansion or replacement will need to be anticipated to minimize training device to weapon system configuration differences caused by a lack of computer system supportability or capacity. This process could be termed Pre-Planned Product Preservation (P4).

GRA

N84-32266# American Defense Preparedness Association, Arlington, Va.

PROCEEDINGS OF THE 5TH INTERSERVICE-INDUSTRY TRAINING EQUIPMENT CONFERENCE, VOLUME 2

16 Nov. 1983 269 p Proc. held in Washington, D.C., 14-16 Nov. 1983

(AD-A142775) Avail: NTIS HC A12/MF A01 CSCL 05I

The theme of this conference is increased readiness through training. Certainly, meeting this challenge becomes more difficult year by year as our weapon systems become more capable and also more complex. Multi-million dollar weapon systems demand the ultimate in training to ensure that crews are ready to operate them at their maximum effectiveness. Otherwise, we may have wasted valuable dollars buying increased capability that, for the lack of training, we cannot use effectively. This, then, is our readiness through training challenge. The purpose of these conferences is to promote the interchange of information between government and industry. It is only when industry thoroughly understands the government need and government thoroughly understands industry's capability that we can work together and function effectively as a team.

GRA

N84-32276 Illinois Univ., Urbana-Champaign.

THE RELATIONSHIP BETWEEN ADMINISTRATIVE STYLE AND THE USE OF COMPUTER-BASED SYSTEMS: AN ATTITUDINAL STUDY OF ACADEMIC LIBRARY PROFESSIONALS Ph.D. Thesis

J. N. OLSGAARD 1984 230 p

Avail: Univ. Microfilms Order No. DA8409822

The relationships between the attitude of academic library professionals toward the level of participative management used by immediate supervisors in academic libraries in the United States, and the attitude of professional academic library employees toward computer-based systems is studied. The null hypothesis was that no statistically significant relationship exists between these variables. The alternative hypothesis was that a statistical relationship does exist. In order to explore the above hypotheses a mail survey was conducted of two populations. It was determined that a statistically significant nonlinear relationship does exist between the variables, that is, that the alternative hypothesis was supported. It was further determined that a model explaining the variation of the attitude of academic librarians toward computer-based systems could be constructed. This model was tested by instituting a logarithmic transformation of both the data reflecting the level of participative management, and of the data of a variable reflecting exposure to computer-based systems. By imposing additional refinements, over 80 percent of the variance of the dependent variable could be explained through the use of this proposed model.

Dissert. Abstr.

N84-33252# Air Command and Staff Coll., Maxwell AFB, Ala.

DETERMINATION OF FACTORS AFFECTING PERFORMANCE AND PRODUCTIVITY IN AN ENGINEERING/DESIGN ENVIRONMENT

R. J. ROSALES, JR. Mar. 1984 108 p

(AD-A143315; ACSC-84-2225) Avail: NTIS HC A06/MF A01 CSCL 05A

Within all organizations there exist opportunities for constructive change, e.g., improving employee motivation, increasing management effectiveness, and enriching the quality of work life. This study attempts to generalize employee perceptions towards their organization and through inductive reasoning offer a basis for strategy selection to maximize the effects of the constructive change being sought. This study delves into the structure of a Real Property Maintenance Activity, its people and their perceptions of the work environment. It attempts a critical analysis not for the

01 HUMAN FACTORS AND PERSONNEL ISSUES

purpose of censure but rather to introduce one method that can precede constructive change in order to realize the full potential of the change. GRA

N84-34162# Minnesota Univ., Minneapolis. Dept. of Psychology.

COMPUTER-BASED MEASUREMENT OF INTELLECTUAL CAPABILITIES Final Report, Sep. 1976 - Jan. 1983

D. J. WEISS Dec. 1983 29 p
(Contract N00014-76-C-0243; RRO-4204)

(AD-A144065) Avail: NTIS HC A03/MF A01 CSDL 09B

The research program's objectives are described, and the research approach is summarized and related to the sixteen technical reports completed under this contract. Fifteen major research findings are presented. The implications of the research findings and methods for future research in computerized testing and adaptive testing are described. Also included are abstracts of the sixteen technical reports. Author (GRA)

N84-34169# Air Force Human Resources Lab., Brooks AFB, Tex.

VALIDATION OF RELATIVE-TIME-SPENT RATING SCALES Interim Report, Jul. - Dec. 1981

S. K. GARCIA Jul. 1984 41 p

(Contract AF PROJ. 7719)

(AD-A144067; AFHRL-TP-84-11) Avail: NTIS HC A03/MF A01 CSDL 051

Relative-time-spent rating scales are used as the primary measuring device in task-oriented job inventories. These scales permit incumbents to report the amount of work time they spend on each task performed relative to time spent on other tasks. Measures of relative time spent are currently being collected by the Air Force and other governmental agencies; however, no consensus has been reached regarding the optimal scale format to use in obtaining time spent-performing data. The general lack of consensus regarding the optimal scale has stemmed primarily from the difference among scientists in their opinions about scaling procedures, scale construction, application of scales and validity of scales. This paper summarizes the results of a feasibility study conducted to validate various relative-time-spent scale formats. The criterion for validation was collected via direct field observations. The primary objective of this investigation was to determine the relative validity of binary (perform/not perform), 9- and 25-point scales using actual time spent and frequency of observed task performance criteria. Results of this investigation indicated that the 9-point relative-time-spent scale provided the optimal format for use in the Air Force occupational analysis program. Author (GRA)

N84-34317# Naval Postgraduate School, Monterey, Calif.

AN ANALYSIS OF THE EFFECTIVENESS OF THE PROBLEM SOLVING SKILLS FOR MANAGERS TRAINING PACKAGE-USCG M.S. Thesis

D. J. IHNAT Mar. 1984 137 p

(AD-A144017; AD-E751074) Avail: NTIS HC A07/MF A01 CSDL 05A

This thesis examines the Problem Solving Skills for Managers training package, piloted by the Coast Guard Leadership and Management School in April 1983. Four questionnaire instruments developed by the company which produced the training package were analyzed to determine the effectiveness of the training program. A quasi-experimental pre-test/post-test/control group research design was used by the Coast Guard project manager and this thesis used a regression procedure to counter-act any regression effect. The results of the analysis suggest that the training program was not effective as given and suggests further study to determine why it was not effective. Author (GRA)

02

MANAGEMENT THEORY AND TECHNIQUES

Includes Management Overviews and Methods, Decision Theory and Decision Making, Leadership, Organizational Structure and Analysis, Systems Approaches, Operations Research, Mathematical/Statistical Techniques, Modelling, Problem Solving, Management Planning.

A84-15220

FUZZY-NETWORK PLANNING - FNET

I. GAZDIK (IG Innovation, Spanga, Sweden) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 304-313. refs

Currently used network planning techniques, such as PERT/CPM and their derivatives, assume that, in a graph of known structure, the duration of its activities is known either with certitude or at least with some probability. However, in many applications the structure of the graph and the duration of its activities are imprecise. This paper shows how the application of fuzzy sets to such problems can yield quasideterministic results obtained from imprecise input data. Author

A84-15312

METHODS AND PRACTICES OF PLANNING - PHYSICAL PLANNING, RESOURCES, FINANCIAL SIMULATION [METHODES ET PRATIQUES DE LA PLANIFICATION - PLANNING PHYSIQUE, RESSOURCES, SIMULATION FINANCIERE]

P. ZERVUDACKI (Societ'Etudes Techniques et d'Entreprises Generales, Le Plessis-Robinson, Hauts-de-Seine, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings. Toulouse, Cepadues-Editions, 1983, p. 331-341. In French.

A84-15322

RISK ASSESSMENT [LA PRISE EN COMPTE DES RISQUES]

P. FOUSSIER (Centre National d'Etudes Spatiales, Paris, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings. Toulouse, Cepadues-Editions, 1983, p. 651-705. In French. refs

Techniques used to analyze quantitatively the risks involved in technological development programs are reviewed and illustrated. The general problem of risk assessment (RA) in decision making processes is introduced, and a typology of uncertainties is set forth. Two principal approaches to RA are characterized - a technique which starts from the work breakdown structure of the project and is especially well adapted to the initial design-study phase, and a technique which assumes knowledge of the hierarchy of the tasks to be accomplished and is best employed in the development phase. Both analytical and simulation methods are considered, and formulas, sample calculations, and graphs are included. Consideration is also given to methods used to collect the input data for the RA calculations, including both subjective (expert, group-of-experts, and Delphi) and objective (analogy and Freiman-analysis) techniques. The impact of RA on definition, estimation, planning, and contractual politics is indicated. T.K.

A84-15599

IDENTIFYING OPERATIVE GOALS BY MODELING PROJECT SELECTION DECISIONS IN RESEARCH AND DEVELOPMENT

M. J. STAHL (Clemson University, Clemson, SC) and A. M. HARRELL (South Carolina, University, Columbia, SC) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-30, Nov. 1983, p. 223-228. refs

In an R&D laboratory, Behavioral Decision Theory was used to identify operative goals as a method of organizational analysis. Six goals were used as criteria in a decision-making exercise wherein 69 managers made decisions about hypothetical projects. Two goals accounted for 84 percent of the explainable variance and were deemed operative goals. Furthermore, a lack of

consensus concerning these goals' importance existed among the laboratory's four divisions. Author

A84-15600

MANAGING ENGINEERS EFFECTIVELY

H. J. THAMHAIN (Worcester Polytechnic Institute, Worcester, MA) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-30, Nov. 1983, p. 231-237. refs

The professional needs of engineering personnel are investigated. Their degree of satisfaction is positively associated with overall engineering performance. All of the 16 specific needs analyzed involve 3 primary issues: (1) people skills, (2) organizational structure, and (3) management style, influenced by the task to be performed and the surrounding environment. To be effective, engineering managers must understand the dynamics of their organizations so they can diagnose potential problems and the need for change. Specific suggestions are made to increase the engineering manager's effectiveness and to improve overall engineering productivity. Author

A84-19141

INCENTIVE STACKELBERG STRATEGIES FOR DETERMINISTIC MULTI-STAGE DECISION PROCESSES

Y. P. ZHENG, T. BASAR (Illinois, University, Urbana, IL), and J. B. CRUZ, JR. IN: Conference on Decision and Control, 21st, Orlando, FL, December 8-10, 1982, Proceedings. Volume 3. New York, Institute of Electrical and Electronics Engineers, 1982, p. 1053-1058. refs
(Contract N00014-79-C-0424; N00014-82-K-0469)

In this paper, we formulate a general incentive Stackelberg dynamic game problem with informational advantage to the leader at each stage of the decision process, which involves partial observation of the follower's decisions. Under a feedback Stackelberg solution concept adapted to this information pattern, some general results on the existence and construction of optimal incentive strategies are obtained, and the derivation of optimal affine policies is discussed. The paper also deals with the global Stackelberg solution in discrete and continuous-time games, and obtains conditions for the existence of causal, physically realizable solutions, in terms of the gradients of the cost functionals evaluated at the optimum operating point. Author

A84-21643

AN INTERACTIVE SYSTEM FOR SUPPORTING MULTIOBJECTIVE DECISION MAKING

V. WUWONGSE (Asian Institute of Technology, Bangkok, Thailand), S. KOBAYASHI, and A. ICHIKAWA (Tokyo Institute of Technology, Yokohama, Japan) Automatica (ISSN 0005-1098), vol. 19, Nov. 1983, p. 697-702. refs

The purpose of this paper is to develop an interactive system for supporting the decision making process under multiple objectives and to empirically evaluate its performance. An interactive algorithm underlying the system is proposed with emphasis on the psychological aspects of the decision maker (DM). A choice process model is developed, based on pairwise comparison judgments of alternatives, because the judgments are basic and easy for a DM. A corresponding interactive algorithm is implemented and compared with other existing algorithms. Two kinds of comparative experiments, numerical and subject experiments, are conducted to verify the validity of the choice model as well as the practical effectiveness and the convergence of the algorithm. Author

A84-21644

MODELING AND ANALYSIS OF TEAMS OF INTERACTING DECISIONMAKERS WITH BOUNDED RATIONALITY

K. L. BOETTCHER and A. H. LEVIS (MIT, Cambridge, MA) Automatica (ISSN 0005-1098), vol. 19, Nov. 1983, p. 703-709. refs
(Contract AF-AFOSR-80-0229)

A methodology for analyzing and evaluating alternative organizational structures is presented. An information theoretic framework is used in which each team member is described by a

two-stage model consisting of situation assessment and response selection stages as well as interconnections with the rest of the organization. The information processing and decisionmaking load of each team member and the measure of organizational performance are depicted in the performance-workload space as implicit functions of the decision strategies of each individual member. The approach to evaluating organizational structures using the methodology for analysis of an organization consisting of two decisionmakers with bounded rationality. Author

A84-23989

INTEGRATED MANAGEMENT IN MATRIX ORGANIZATION

W. C. WALL, JR. (WCW Associates, Inc., Huntsville, AL) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Feb. 1984, p. 30-36. refs

Because project management requires the integration of all planning and management control activities, planning must encompass tactical, strategic and operational considerations, functionally oriented efforts must constitute a unified whole, and a project's technical performance, cost, and schedule parameters must be integrated into a systemic composite. Integrated management has, accordingly, both an organizational and a program component that are distinct and yet interrelated. Attention is presently given to the conceptual basis of these two components of integrated management from a systemic viewpoint, with a view to their interrelationships. O.C.

A84-25008

ANALOGY IN SYSTEMS MANAGEMENT - A THEORETICAL INQUIRY

B. G. SILVERMAN (George Washington University, Washington, DC) IEEE Transactions on Systems, Man, and Cybernetics (ISSN 0018-9472), vol. SMC-13, Nov.-Dec. 1983, p. 1049-1075. refs

Analogy is frequently treated in the systems management literature as the archetypical intuitive-complex process in which experts exercise (analogy and disanalogy) judgments in the absence of adjuvants and in which little or no opportunity for structuring is possible. Yet many influential decisions are made via analogical reasoning, and it seems desirable to probe and attempt to understand the process from a more rigorous perspective. This theoretical analysis of the intuitive and diffuse characteristics of analogical reasoning processes is the first step in a research effort intended to lead to (1) understanding of common (and possibly costly) errors, pitfalls, travails, and problem-solving impediments; (2) possible recommendations for improvements to organizational structures, control and coordination processes, and management information flows; and (3) guidelines for a generalized analogical reasoning support framework (e.g., a handbook, a knowledge bank design, and/or even a software package/artificial intelligence program). Author

A84-31213

ENGINEERING TRADEOFF PROBLEMS VIEWED AS MULTIPLE OBJECTIVE OPTIMIZATIONS AND THE VODCA METHODOLOGY

T. W. MORGAN (Drexel University, Philadelphia, PA) and R. L. THURGOOD (Utah State University of Agriculture and Applied Science, Logan, UT) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, May 1984, p. 60-69. refs

This paper summarizes a rational model for making engineering tradeoff decisions. The model is a hybrid from the fields of social welfare economics, communications, and operations research. A solution methodology (Vector Optimization Decision Convergence Algorithm - VODCA) firmly grounded in the economic model is developed both conceptually and mathematically. The primary objective for developing the VODCA methodology was to improve the process for extracting relative value information about the objectives from the appropriate decision makers. This objective was accomplished by employing data filtering techniques to increase the consistency of the relative value information and decrease the amount of information required. VODCA is applied to a simplified hypothetical tradeoff decision problem. Possible

use of multiple objective analysis concepts and the VODCA methodology in product-line development and market research are discussed. Author

A84-31781#

NETWORK ANALYSIS UTILIZING COMPUTER GRAPHICS

F. QIAN Northwestern Polytechnical University, Journal, vol. 2, Jan. 1984, p. 51-62. In Chinese, with abstract in English. refs

The use of computer graphics for network analysis is proposed, laying some groundwork for the application of a graphics to problems such as maximal flow, minimum cost flow, critical path method, program evaluation and review technique, decision analysis, and interpretive structural modelling. The storage of graphs in a computer is briefly explained, the network calculations are presented, and the Dijkstra algorithm for the shortest path problem is presented. Numerical results for $G = (15, 34)$ obtained from { computer are given. The essentials and analytical steps of the shortest path procedure in a particular display unit are explained. C.D.

A84-33463

ARIADNE - A KNOWLEDGE-BASED INTERACTIVE SYSTEM FOR PLANNING AND DECISION SUPPORT

A. P. SAGE and C. C. WHITE, III (Virginia, University, Charlottesville, VA) IEEE Transactions on Systems, Man, and Cybernetics (ISSN 0018-9472), vol. SMC-14, Jan.-Feb. 1984, p. 35-47. refs (Contract N00014-80-C-0542)

The development of an interactive planning and decision support process for multiple criteria alternative selection situations is discussed. Probabilities, utility scores for the lowest level attributes, and attribute trade-off weights, i.e., the parameters, can be imprecisely described by set inclusion. Within a specified structural model of the decision situation, the process allows the decisionmaker to iteratively select the mix of parameter value precision and alternative ranking specificity. By selecting this mix, the decisionmaker is able to direct the alternative selection process in an interactive manner, using alternative selection strategies based on behaviorally meaningful dominance search strategies. Emphasis is placed on the motivation of the research and the behavioral relevance of the support process. References in the bibliography provide further analytical and behavioral discussions related to this process. Author

A84-33465

THE MULTIOBJECTIVE MULTISTAGE IMPACT ANALYSIS METHOD THEORETICAL BASIS

F. A. C. GOMIDE (Centro Tecnológico para Informatica, Sao Paulo, Brazil) and Y. Y. HAIMEIS (Case Western Reserve University, Cleveland, OH) IEEE Transactions on Systems, Man, and Cybernetics (ISSN 0018-9472), vol. SMC-14, Jan.-Feb. 1984, p. 88-98. Research supported by the Conselho Nacional de Pesquisas. refs (Contract NSF ENG-79-03605; DE-AC01-80RA-50256)

Multiojective multistage decisionmaking problems are addressed in the light of multiojective multistage optimization problems for finite-dimensional deterministic systems. Because of the structure of these problems, the concept of a stage trade-off (a dynamic multiojective trade-off) is introduced. The stage trade-off concept generalizes the usual trade-off concept used in static multiojective optimization problems and leads to the notion of impact analysis. The theoretical basis for a newly developed method - the multiojective multistage impact analysis method - (MMIAM) - is presented. Author

A84-42619

ORGANIZATIONAL CORRELATES OF PERCEIVED ROLE PERFORMANCE IN THE RESEARCH LABORATORY

F. HARRISON (Southern Connecticut State University, New Haven, CT) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Aug. 1984, p. 118-121. refs

It is the aim of this paper to show, through an empirical study, that scientists perceive themselves at higher levels of role performance in research laboratories managed through the

so-called 'organic' system identified by Burns and Stalker (1966). More specifically, it is the hypothesis of this paper that the more organic the system of management, the higher the perceived role performance of the individual scientist. The study underlying this paper involved a survey of five research institutes populated by scientists who held faculty rank in a state university and who for the most part were performing basic and applied research in the physical sciences. The findings of this study replicate the empirical results of previous studies which have shown that scientists tend to perceive themselves at high levels of role performance in laboratory settings managed through the organic system. The evidence indicates that perceived and, presumably, actual role performance in the research laboratory will be significantly improved if the individual scientist is encouraged and permitted to participate actively and regularly in the setting of objectives and the making of decisions that affect his research projects. The potential benefits appear to justify much further study of this subject. Author

A84-42622

THE EFFECTIVENESS OF PROJECT MANAGERS - IMPLICATIONS OF A POLITICAL MODEL OF INFLUENCE

D. D. DILL (North Carolina, University, Chapel Hill, NC) and A. W. PEARSON (Manchester, Victoria University, Manchester, England) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Aug. 1984, p. 138-146. refs

R&D laboratory reorganizations designed to enhance the authority and effectiveness of project managers, in the interest of cost reduction and cost effectiveness, are often guided by the 'rational actor model' of organizational reality. This model makes critical assumptions about the relationships among authority, power, and managerial effectiveness and skill. Attention is given to an alternative model, that of 'organizational politics', which study results in a variety of settings indicate to be a superior description of R&D project manager effectiveness. Implications for management development are discussed. O.C.

A84-43469#

CONFIGURATION CONTROL METHODOLOGY FOR SYSTEM PERFORMANCE ENHANCEMENT

M. N. WAGDI (Suez Canal University, Port Said, Egypt) IN: Guidance and Control Conference, Seattle, WA, August 20-22, 1984, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1984, p. 618-623. refs (AIAA PAPER 84-1942)

A new methodology is introduced where the variation of the system configuration parameters are considered as contributions to the control effort. Such consideration results into a more effective and robust controllers that enhance the system performance. A relation between the desired-shift-in-the eigen values and the variation in the system configuration parameters is established. Also a direct relation between the control gain matrix and the variation in the eigen values is established. As an application to the present methodology the configuration control of an aircraft performing a lateral maneuver is worked out. Author

N84-11978# Urban Inst., Washington, D.C.

MOTIVATING MANAGERS: A GUIDE TO PERFORMANCE TARGETING AND PERFORMANCE-BASED PAY IN STATE AND LOCAL GOVERNMENTS

H. P. HATRY, J. M. GREINER, R. GOLLUB, K. STEIL (Public Technology, Inc.), and M. QUAGLIANA (Public Technology, Inc.) 1982 189 p refs (Contract OPM-79-DX-08; NSF DAR-78-261622) (PB83-237834; HUD-0002841) Avail: NTIS HC A09/MF A01 CSCL 051

The assumptions behind performance targeting programs, and appropriate criteria for measuring their success are discussed. Also the impacts resulting from actual trials of the approach are presented along with findings from an examination of four trial programs. The issues and tactics which should be considered if performance targeting is to be instituted in an organization are discussed. The entire presentation emphasizes theories of

02 MANAGEMENT THEORY AND TECHNIQUES

motivation and increased input into decisionmaking that affect work performance. GRA

N84-12784# Carnegie-Mellon Univ., Pittsburgh, Pa. Management Sciences Research Group.

DISJUNCTIVE PROGRAMMING AND A HIERARCHY OF RELAXATIONS FOR DISCRETE OPTIMIZATION PROBLEMS

E. BALAS Jun. 1983 43 p

(Contract N00014-82-K-0329; NR PROJ. 047-607)

(AD-A132004; MSRR-492; WP-69-82-83) Avail: NTIS

HCA03/MFA01 CSCL 12A

The author discusses a new conceptual framework for the convexification of discrete optimization problems, and a general technique for obtaining approximations to the convex hull of the feasible set. The concepts come from disjunctive programming and the key tool is a description of the convex hull of a union of polyhedra in terms of a higher dimensional polyhedron. Although this description was known for several years, only recently was it shown by Jeroslow and Lowe to yield improved representations of discrete optimization problem as the intersection (conjunction) of unions of polyhedra, and define an operation that takes one such expression into another, equivalent one, with fewer conjuncts. Then introduced is a class of relaxations based on replacing each conjunct (union of polyhedra) by its convex hull. The strength of the relaxation increases as the number of conjuncts decreases, and the class of relaxations forms a hierarchy that spans the spectrum between the common linear programming relaxation, and the convex hull of the feasible set itself. Instances where this approach presents advantages include critical path problems in disjunctive graphs, network synthesis problems, certain fixed charge network flow problems, etc. The author illustrates the approach on the first of these problems, which is a model for machine sequencing. Author (GRA)

N84-13010# Information Spectrum, Inc., Arlington, Va.

RIS ASSESSMENT TECHNIQUES: A HANDBOOK FOR PROGRAM MANAGEMENT PERSONNEL

Jul. 1983 255 p refs

(Contract MDA903-82-G-0055)

(AD-A131596; ISI-V-3836-05) Avail: NTIS HC A12/MF A01

CSCL 05A

The primary objectives of this handbook are to make the reader aware of the risk assessment techniques being used by Department of Defense organizations, to alert the reader to the advantages and disadvantages of these techniques, and to assist him in applying risk assessment to his acquisition program. The handbook is intended to be a practical guide and reference for program management personnel - not a textbook dealing with the theories supporting risk analysis, nor a user's manual for applying any particular techniques. Thus, the handbook is organized to address, in summary, the most important questions to program management personnel, i.e., Why do a risk assessment? What techniques are available? How do I select and implement a technique? These questions are answered in the first six chapters. This summary-level material is supported by a series of Appendices that provide detailed discussions of the techniques in use, the service regulations pertaining to risk assessments, a glossary of terms, and a structured bibliography. GRA

N84-14062# Naval Postgraduate School, Monterey, Calif.

KNOWLEDGE BASE MANAGEMENT FOR MODEL MANAGEMENT SYSTEMS M.S. Thesis

G. W. WATSON, JR. Jun. 1983 111 p

(AD-A132211) Avail: NTIS HCA06/MFA01 CSCL 05A

This study examines the issues involved in bringing qualitative and quantitative techniques to bear upon unstructured managerial decisions. Furthermore, this work reviews the problems of user interface and data base interfaces as they relate to aspects of model base managements. The focus of this study is to identify some organizations of knowledge about models within the Decision Support System. In support of this goal, this report investigates what knowledge is, how it is structured, and how it is accessed. Author (GRA)

N84-14705# South African Inst. of Civil Engineers, Pretoria.

IS CRITICAL PATH PLANNING THE ANSWER

A. FLEISCHMANN (Critical Path Planning Services) In its Symp. on Computers in Construction 20 p 1982

Avail: NTIS HC A08/MF A01

The development of an inhouse computer to provide integrated budget control and cash flow forecasting facilities including inflation forecasts is discussed. The programs had to have a direct link to an additional critical path suite of programs. Past and current project management industry trends and problems are analyzed and the system design criteria and management objectives are defined highlighting the interaction of inflation, time, cost and management strategy. Examples of solutions which take cognizance of these factors are included. Author

N84-14966# Naval Postgraduate School, Monterey, Calif.

A CALCULATOR ADAPTATION OF THE MARKOV CHAIN MODEL FOR MANPOWER ANALYSIS M.S. Thesis

J. K. SAPP Jun. 1983 114 p

(AD-A132990) Avail: NTIS HCA06/MFA01 CSCL 05I

This thesis provides a foundation for the application of fundamental Markov analysis to manpower modeling in the Armed Services or in other similar organizations. A handheld calculator software package is introduced to assist students, military analysts, and others who model manpower systems. Markov analysis methods are incorporated in program software to permit discrete time investigation of the Navy's manpower structure. A user program guide for application to a broad range of manpower issues is also presented. Author (GRA)

N84-14969# Los Alamos Scientific Lab., N. Mex.

BENCHMARKING UNSTRUCTURED SYSTEMS

L. BRICE, J. CONNELL, and G. LOCKHART 1983 13 p refs Presented at CHI 1983 Conf., Cambridge, Mass., 12 Dec. 1983

(Contract W-7405-ENG-36)

(DE83-011175; LA-UR-83-1207; CONF-831202-1) Avail: NTIS

HC A02/MF A01

Systems developed without the advantage of structured techniques are discussed. When an unstructured system is identified, management must decide if it should be rewritten according to modern standards. Management decision making in one data processing shop is described. To be judged successful, a system should be friendly, useful and easily maintainable. It is shown that psychologically complex programs are more expensive to maintain than those developed with structured techniques, free from such complexity. Three suspect systems were statistically measured against a base system. When a suspect system proved at least as psychologically complex as the base system, future maintenance costs were assumed to be at least as high as for the benchmark system. The study provided management with a more accurate view of programmer work habits. Programmers previously judged to be extremely competent created a high level of psychological complexity which is expected to result in high maintenance costs when other programmers become responsible for the system. DOE

N84-16068# School of Aerospace Medicine, Brooks AFB, Tex. **ORGANIZATIONAL-CLIMATE DIMENSIONS: A CONCEPTUAL AND JUDGMENTAL ANALYSIS Final Report, Jan. 1980 - Dec. 1981**

G. E. SECRIST, V. L. PADEN, and R. C. MCNEE Aug. 1983 19 p

(Contract DA PROJ. 7930)

(AD-A132898; SAM-TR-83-24) Avail: NTIS HCA02/MFA01

CSCL 05A

Identifying salient climate dimensions and determining their generality across a variety of organizational settings are important aspects of the study of organizational climate. The purpose of this study was to determine the conceptual similarity among a sample of organizational variables and to ascertain the adequacy of a new seven-dimension organizational-climate taxonomy to account for these variables. Twelve judges independently classified 105 organizational variables from 14 research investigation, using

02 MANAGEMENT THEORY AND TECHNIQUES

the new climate taxonomy. Nearly 70% of the 105 variables were classified within the framework of the climate taxonomy by a criterion of agreement of six or more judges. Complete classification agreement across all possible pairs of judges was found for nearly 50% of the 105 variables. On the average, 7 of the 12 judges agreed on the classification of the 105 organizational variables. These findings demonstrate that considerable conceptual similarity exists among the types of organizational variables found in a sample of the research literature and that the new taxonomy has sufficient utility to warrant further development. GRA

N84-16925# North Carolina Univ., Chapel Hill. Curriculum in Operations Research and Systems Analysis.

ESTIMATING CRITICAL PATH AND ARC PROBABILITIES IN STOCHASTIC ACTIVITY NETWORKS

G. S. FISHMAN Aug. 1983 26 p

(Contract N00014-76-C-0302)

(AD-A134255; UNC/ORSA/TR-83/5) Avail: NTIS HC A03/MF A01 CSCL 12A

This paper describes a new procedure for estimating parameters of a stochastic activity network of N arcs. The parameters include the probability that path m is the longest path, the probability that path m is the shortest path, the probability that arc i is on the longest path and the probability that arc i is on the shortest path. GRA

N84-17957# Purdue Univ., Lafayette, Ind. Dept. of Statistics.
ON USING SELECTION PROCEDURES WITH BINOMIAL MODELS

S. S. GUPTA and G. C. McDONALD Oct. 1983 26 p

(Contract N00014-75-C-0455)

(AD-A135275; TR-83-44) Avail: NTIS HC A03/MF A01 CSCL 12A

A subset selection procedure R for binomial populations is considered for the problem of selecting the best of k vendors whose manufacturing processes have the probabilities p_1, \dots, p_k of turning out an item which conforms to specifications. The operating characteristics (i.e., selection probabilities and expected size of the selected subset) of this rule are related to the underlying p_i 's, the common sample size n , and d . Formulae (both exact and asymptotic) are given for these quantities for slippage as well as equi-spaced parametric configurations. Tables and graphs relating these quantities are presented for three specific slippage configurations. Numerical illustrations are given to show the use of the tables in determining the sample size n and the constant d to be used in the rule R . GRA

N84-18094# Oak Ridge National Lab., Tenn. Mathematics and Statistics Research.

TWO-LEVEL COMPROMISE DESIGNS FOR ESTIMATING MAIN EFFECTS AND DETECTING INTERACTIONS

M. D. MORRIS and T. J. MITCHELL Nov. 1983 35 p refs

(Contract W-7405-ENG-26)

(DE84-002997; ORNL/CSD-126) Avail: NTIS HC A03/MF A01

A procedure for constructing experimental designs for use in estimating main effects, and detecting the presence of interactions in factorial models is described. The D -optimality and $tr(L)$ -optimality are two design selection criteria used in constructing these compromise designs. A catalogue of compromise designs for $k = 4$ through 9 and $n = k + 2$ through $2k + 1$ is given, where k is the number of experimental factors and n is the number of experimental runs. DOE

N84-19124# Defense Systems Management School, Fort Belvoir, Va.

MANAGEMENT OF RISK AND UNCERTAINTY IN SYSTEMS ACQUISITION: PROCEEDINGS OF THE 1983 DEFENSE RISK AND UNCERTAINTY WORKSHOP

R. F. WILLIAMS and R. D. ABEYTA 15 Jul. 1983 292 p Workshop held in Fort Belvoir, Va., 13-15 Jul. 1983

(AD-A136230) Avail: NTIS HC A13/MF A01 CSCL 15E

The general objectives of this workshop were to report on state of the art techniques and exchange information on risk and

uncertainty within the Department of Defense Panel Sessions covered these topics: methods and models; budgeting and contracting risk; computer aids in decision making; management view of acquisition risk; behavior under risk and uncertainty; risk analysis; advanced theory; and issues in risk and uncertainty. GRA

N84-19127# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

Q-GERT MODEL OF THE CONTRACTING CYCLE M.S. Thesis

C. D. MILLER Sep. 1983 700 p

(AD-A135639; AFIT-LSSR-118-83) Avail: NTIS HC A99/MF A01 CSCL 05A

To improve the efficiency of a Government contracting organization, a manager must predict the consequences of decision alternatives. There are so many variables (workload, resources, experience levels, changing procedures) that predicting, or even measuring, the effect of various decision alternatives is very difficult. The research objective was to construct and test a Q-GERT model of the contracting cycle of an Air Force research and development contracting organization. Data were collected on the contracting procedures used. Twenty eight contract networks were developed, from the administrative notice to the 10 million dollar competitive contract. Each network was divided into many small tasks. Experienced buying personnel provided estimates of a range of time to complete each task. The result was that the model successfully imitated the contracting cycle time from receipt of the purchase request to the contract award. A manager can use the model to test the effect of changes in resources or procedures on the contracting cycle time. The model should be a valuable management tool. Author (GRA)

N84-19129# Lockheed Missiles and Space Co., Sunnyvale, Calif. Space Systems Div.

SYSTEM ENGINEERING MANAGEMENT GUIDE

3 Oct. 1983 236 p

(Contract MDA903-82-C-0339)

(AD-A136020) Avail: NTIS HC A11/MF A01 CSCL 05A

The primary objective of this Guide is to provide a working familiarity with System Engineering Management. System Engineering has gained increasing attention since its recognition following World War II. This has been stimulated by the increasing cost and technical complexity of development and acquisition programs. Some of this attention is no doubt due to large program failures which possibly could have been avoided, or at least mitigated, through the use of System Engineering. In today's acquisition environment it is not sufficient to apply only basic engineering principles. The complexity of a modern major weapon system requires conscious application of System Engineering principles and concepts to ensure producible, operable, and supportable systems that satisfy mission requirements. The Guide covers the development of a system from inception to operational deployment and use. It is divided into five modules: System Engineering Management; System Definition; Configuration Definition and Management; Technical Performance Achievement; and Operational Feasibility. GRA

N84-19132# School of Aerospace Medicine, Brooks AFB, Tex. Crew Technology Div.

A SET OF ORGANIZATIONAL-CLIMATE MEASURES: INTERNAL CONSISTENCY, FACTOR STRUCTURE, AND PREDICTIVE POWER Final Report, Jan. 1980 - Dec. 1981

G. E. SECRIST, R. C. MCNEE, and V. L. PADEN Oct. 1983 30 p

(Contract AF PROJ. 7930)

(AD-A135352; SAM-TR-83-26) Avail: NTIS HC A03/MF A01 CSCL 05A

A major obstacle to understanding organizational behavior is the lack of highly reliable instruments to assess the principal dimensions of an organization's climate. The analysis reported here was undertaken to improve the precision of a set of organizational-climate measures grounded on a new theoretical-conceptual model of human and organizational

effectiveness, and to provide a related taxonomy of climate dimensions. The data base for the analysis consisted of approximately 1,000 U.S. Air Force scientist-engineers working in five separate Government research and development organizations. Internal consistency analysis and factor analysis were used to assess reliability and dimensional purity, while correlational analysis was used to evaluate relations with selected performance and job-satisfaction criteria. The organizational-climate measures demonstrated promising psychometric characteristics. Generally high reliabilities (.80 to .95), satisfactory factor structure, and encouraging validities provide a sound foundation for further refinement. GRA

N84-20165# Yale Univ., New Haven, Conn. School of Organization and Management.

A NORMATIVE MODEL OF WORK TEAM EFFECTIVENESS Interim Report

J. R. HACKMAN Nov. 1983 74 p

(Contract N00014-80-C-0555)

(AD-A136398; AD-E000556; SOM-TR-2) Avail: NTIS HC

A04/MF A01 CSCL 05A

Descriptive research on group performance has produced neither a set of empirical generalizations sturdy enough to guide the design and management of work teams, nor interventions that reliably improve team effectiveness. As an alternative, a normative model of group effectiveness is proposed and discussed. The model identifies potentially manipulable aspects of the group and its context that are particularly potent in promoting team effectiveness, and organizes those factors to make them useful in diagnosing the strengths and weaknesses of task-performing teams. The final section of the paper explores the implications of the normative model, and outlines the beginnings of an action model for creating and maintaining effective work groups in organizations. Author (GRA)

N84-20166# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

TOWARD AN INTERPERSONAL PARADIGM FOR SUPERIOR-SUBORDINATE COMMUNICATION Ph.D. Thesis

T. L. BANGS Nov. 1983 205 p

(AD-A135863; AFIT/CI/NR-83-77D) Avail: NTIS HC A10/MF

A01 CSCL 05J

The purpose of this dissertation is to report formulative research on an interpersonal paradigm for superior-subordinate communication. The suggested paradigm goes beyond traditional structural approaches to leadership and rests on the interpersonal perception theory of Laing, Phillipson, and Lee. The following theoretical propositions were tested: (1) Highly confirming behavior by a superior, as perceived by an immediate subordinate, is related to a high degree of subordinate feedback. (2) Highly confirming behavior by a superior, as that behavior is perceived by a subordinate, is related to greater communication of creativity from the subordinate to the superior. (3) High superior disclosure, as perceived by a subordinate, is related to a high degree of subordinate feedback. (4) A high degree of superior accessibility, as perceived by a subordinate, is related to greater communication of creativity from the subordinate to the superior. (5) A high degree of superior accessibility, as perceived by a subordinate, is related to a high degree of subordinate feedback. GRA

N84-20167# Yale Univ., New Haven, Conn. School of Organization and Management.

AN INTERGROUP PERSPECTIVE ON GROUP DYNAMICS Interim Report

C. P. ALDERFER Oct. 1983 94 p

(Contract N00014-82-K-0715)

(AD-A135582; SOM-WP-57) Avail: NTIS HC A05/MF A01

CSCL 05J

Intergroup perspectives began to shape the understanding of human behavior from the beginning of the twentieth century. Intergroup theory provides interpretations for individual, interpersonal, group, intergroup, and organizational relations. The version of intergroup theory given here uses a definition of group

that is concerned with both internal and external properties. It explains intergroup dynamics in terms of group boundaries, power, affect, cognition, and leadership behavior. It examines the nature of identity and organization groups. It relates the state of intergroup relations to the suprasystem in which they are embedded. It presents an understanding of the changing relations among interdependent groups and their representatives through the operation of parallel and unconscious processes. The theory relates to a wide array of social and organizational problems, including the development of effective work teams, the definition and management of organizational culture, and the teaching of organizational behavior in Management schools. GRA

N84-20424# Carnegie-Mellon Univ., Pittsburgh, Pa. Robotics Inst.

KNOWLEDGE-BASED SUPPORT SYSTEMS FOR LONG RANGE PLANNING Interim Report

D. W. KOSY and V. DHAR Dec. 1983 45 p

(AD-A137311; CMU-RI-TR-83-21) Avail: NTIS HC A03/MF A01

CSCL 05A

Long range planning is the process by which an organization assesses its future environment and develops specific plans of action to respond to, or change, that environment to achieve its goals. This report presents the results of a study of long range planning practices at one plant of a large U.S. computer firm, focusing on current and potential decision support systems (DDSs) for the quantitative aspects of the planning process. While it appears that the clerical tasks in the process can be computerized using current DDS technology, this technology does not help managers evaluate the credibility or quality of the plans made. An architecture is described for a system incorporating a much richer store of knowledge about planning variables which would allow the system itself to validate, explain, and justify its results. A concrete realization of such a system, called ROME, has been designed and is currently under development. Design goals for ROME are presented and potential uses of the system are illustrated. Author (GRA)

N84-20427# Carnegie-Mellon Univ., Pittsburgh, Pa. Management Sciences Research Group.

ON THE FACIAL STRUCTURE OF SCHEDULING POLYHEDRA

E. BALAS Aug. 1983 56 p

(Contract N00014-82-K-0329; NSF ECS-82-05425; NR PROJ.

047-607)

(AD-A136983; MSRR-496; WP-16-83-84) Avail: NTIS HC

A04/MF A01 CSCL 12A

A well-known job shop scheduling problem can be formulated as follows. Given a graph G with node set N and with directed and undirected arcs, find an orientation of the undirected arcs that minimizes the length of a longest path in G . The author treats the problem as a disjunctive program, without recourse to integer variables, and give a partial characterization of the scheduling polyhedron $P(N)$, i.e., the convex hull of feasible schedules. In particular, he derives all the facet inducing inequalities for the scheduling polyhedron $P(K)$ defined on some clique with node set K , and give a sufficient condition for such inequalities to also induce facets of $P(N)$. One of our results is that any inequality that induces a facet of $P(H)$ for some H properly included in K , also induces a facet of $P(K)$. Another one is a recursive formula for deriving a facet inducing inequality with p positive coefficients from one with $p-1$ positive coefficients. The author also addresses the constraint identification problem, and gives a procedure for finding an inequality that cuts off a given solution to a subset of the constraints. Author (GRA)

N84-21395# Naval Postgraduate School, Monterey, Calif.

DECISION THEORY: INDIVIDUAL BIASES AND THEIR EFFECT ON FORECASTING IN AN ORGANIZATION M.S. Thesis

J. T. SHANNON and D. A. SCHWIERING Dec. 1983 67 p

(AD-A137943) Avail: NTIS HC A04/MF A01 CSCL 05A

There has been a great deal written about how individual cognitive biases effect decision making. However, there is little empirical evidence to show how such heuristic patterns affect

02 MANAGEMENT THEORY AND TECHNIQUES

decision making within organizations. This thesis reviews the literature concerning heuristics and behavioral decision theory and then examines budgetary forecasting decisions within two large organizations to see if these biases can be observed in forecasts produced within organizations. Author (GRA)

N84-22166# Institute for Perception RVO-TNO, Soesterberg (Netherlands). Experimental Psychology Group.

SOCIETAL VERSUS INDIVIDUAL DECISION MAKING: HOW THEY MIGHT DIFFER

S. LICHTENSTEIN and W. A. WAGENAAR Oct. 1983 43 p refs

(IZF-1983-20; TDCK-78678) Avail: NTIS HC A03/MF A01

The situation in which a societal decision maker (SDM) is responsible for making decisions whose effects fall primarily or exclusively on other people is discussed. The causes of differences between the decisions made by the SDMs and the preferences of the affected individuals and ways to resolve such discrepancies are considered. Discrepancies are traced to different perspectives on the problem, different values, or differences in the customary methods that people use when making decisions. For resolving decision discrepancies, the SDM should first make the decision and then, before implementing it, make a meta-analysis of that decision and its potential for generating disagreements. Once the possible source or sources of disagreements are found, resolution can be sought. Author (ESA)

N84-22342# University of Southern California, Los Angeles. Social Science Research Inst.

EQUAL WEIGHTS, FLAT MAXIMA, AND TRIVIAL DECISIONS

R. S. JOHN, W. EDWARDS, D. VONWINTERFELDT, and F. H. BARRON Jun. 1980 28 p Prepared in cooperation with Kansas Univ., Lawrence

(Contract N00014-79-C-0038)

(AD-A138506; AD-F630004; SSRI-RR-80-2) Avail: NTIS HC A03/MF A01 CSCL 12A

Most predictions are intended as a basis for decision making. The point of this paper is that prediction and decision require different methods. Equal weights, while often useful for prediction, are less useful for decision making. The action options available in any decision problem fall into three classes: sure winners, sure losers, and contenders. Sure winners and sure losers are defined by dominance, accepting sure winners and rejecting sure losers is trivial. Good decision rules should discriminate well among contenders. In the familiar pick-1 decision problem, options on the Pareto frontier (i.e., undominated options) almost always show negative correlations among attributes. Such negative correlations make equal weights inappropriate. This paper extends that result to the case in which a decision maker must pick k options out of n. In this case, the set of sure winners is usually not empty. It develops general procedures for identifying the set of contenders, given the options, k, and n. This set is a generalized Pareto frontier, of which the traditional kind is a special case. Simulations show that attribute intercorrelations among contenders are substantially depressed and typically negative, even if the intercorrelations in the whole set are positive. Such negative correlations among contenders strongly question the usefulness of equal weights for decision making. GRA

N84-23302# Air Force Business Research Management Center, Wright-Patterson AFB, Ohio.

DECISION TECHNOLOGY: THE CATALYST FOR ACQUISITION IMPROVEMENT Final Report

R. P. SWANK and H. M. WALES In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 43-48 1983

(AD-P002755) Avail: NTIS HC A24/MF A01 CSCL 15E

It is possible to manage all activities in a weapon acquisition with a system that predicts and achieves desired results. DECISION TECHNOLOGY provides the Program Manager with the exact information he needs to synthesize all program elements to accurately predict performance probability without compromising management style or objectives. It embraces a basic language

that simplifies understanding and communication and applies a fundamental logic that clarifies the implications of each management action. It presents the RISK and CONSEQUENCE visibility in a format that enables the Program Manager to make necessary decisions and confidently defend them knowing they will achieve the results expected. Therefore, all the weapon system expectations are precisely known at all times. DECISION TECHNOLOGY applied in over seventy applications has resulted in significant savings in cost and time along with achievement of predictable outcomes. Author (GRA)

N84-23305# Army Armament Research and Development Command, Dover, N. J.

AN ANALYSIS OF THE ACQUISITION STRATEGY DECISION PROCESS ALONG THREE DIMENSIONS OF THE ACQUISITION IMPROVEMENT PROGRAM Final Report

H. A. HEINZ In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 64-77 1983

(AD-P002758) Avail: NTIS HC A24/MF A01 CSCL 15E

This study investigates the acquisition strategy decision process as it relates to the major themes of the Acquisition Improvement Program (AIP). Further, it examines a wide spectrum of acquisition, program, contracting, and industry considerations. The study isolated variables critical to the AS decision process, defined their causal relationships, and produced a causal model. Findings support the notion that a program's effect on the industrial base, readiness/sustainability, and cost can be pre-determined from a specific number of program factors. Further, their effects can be enhanced or otherwise altered by a few, key AS approaches/factors. The findings also suggest that programs with limited competition at the subsystem level fare better than those predicted on the extremes of either open competition with component breakout or restricted to a sole source of the systems level; that a moderate, middle-of-the-road AS approach is more effective for most programs. GRA

N84-23333# University of Southern California, Los Angeles.

AN APPLICATION OF THE CAUSAL-INTEGRATIVE MODEL Final Report

I. A. SOMERS and P. C. GARDINER In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 217-221 1983

(AD-P002786) Avail: NTIS HC A24/MF A01 CSCL 15E

Historical analyses of program acquisitions indicate that the probability of cost growth and/or schedule slippages is high. Many research efforts have been directed at identifying the causal factors leading to these changes in program performance. Much of the research has been devoted to modeling the acquisition process with the goal being a more effective control of program performance. A common observation of researchers is that the acquisition process is a complex and interrelated set of events. As such, any comprehensive model that claims to represent this process must reflect these interrelated activities, many of which can be described by feedback loops. This paper discusses one such model that utilizes the Systems Dynamic approach to simulation to portray the processes that form collectively the program acquisition cycle. The Causal-Integrative Model (CIM) was just presented in its conceptual form at the Management of Risk and Uncertainty Symposium in February, 1981, at the U.S. Air Force Academy, Colorado. This paper reports on the computer-based operational form of the CIM. The results of applying the computerized model to one acquisition program are presented. Author (GRA)

N84-23368# Logistics Management Inst., Washington, D. C.
A CONCEPT FOR MISSION-ORIENTED PLANNING FOR SYSTEM ACQUISITION AT THE DEFENSE COMMUNICATIONS AGENCY Final Report

F. L. ADLER, C. B. BAIRD, and J. S. DOMAIN /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 446-453 1983
 (AD-P002823) Avail: NTIS HC A24/MF A01 CSCL 15E

The Defense Communications Agency (DCA) is responsible for a broad range of system acquisition functions for Department of Defense (DoD) command, control, and communications (C3) programs as well as analytic and automatic data processing (ADP) support to the Joint Chiefs of Staff (JCS) and the Office of the Secretary of Defense (OSD). To better accomplish these functions DCA has begun a corporate-wide system integration initiative based on mission planning consistent with Department of Defense Directive (DoDD) 5000.1, Major System Acquisition. The initiative has three objectives: higher quality mission analysis, a better bridge from mission analysis into system acquisition, and more effective consideration of supportability of C3 systems and equipments. This paper describes DCA's planning initiative, its implementation approach, and the current status. The initiative, a mission-oriented planning concept, is currently under development and trial implementation within DCA. Author (GRA)

N84-24102# California Univ., Santa Barbara.
RESEARCH AGENDA IN NON-LINEAR DECISION SYSTEMS

Nov. 1983 81 p refs
 (Contract NSF OIR-82-12817)
 (PB84-161207; NSF/OIR-83006) Avail: NTIS HC A05/MF A01 CSCL 05J

Discussions presented at the workshop are summarized. Non-linear systems are identified as that class of open systems whose non-linear interactions permit evolution through bifurcation and self-structuring, and whose driving influences are the decisions of humans, both as individuals and interacting in groups. The concept of evolutionary systems is established as the overarching paradigm for non-linear decision systems, and these systems are explored within the context of the evolutionary paradigm. Representative research topics in non-linear decision systems are examined, including geographical evolution, urban and regional modeling, cognitive locus theory, cognitive process modelling of individual and aggregate decision making, periodic markets, evolutionary stages of national systems, and design of large infrastructure systems. Workshop participants are listed. GRA

N84-24309# Wisconsin Univ., Madison. Mathematics Research Center.

EXPERIMENTAL DESIGN: REVIEW AND COMMENT Technical Summary Report

D. M. STEINBERG and W. G. HUNTER Feb. 1984 88 p
 (Contract DAAG29-80-C-0041; NSF MCS-82-10950)
 (AD-A139268; MRC-TSR-2639) Avail: NTIS HC A05/MF A01 CSCL 12A

This document reviews major developments in the design of experiments, offers thoughts on important directions for the future, and makes specific recommendations for experimenters and statisticians who are students and teachers of experimental design, practitioners of experimental design, and researchers jointly exploring new frontiers. Specific topics covered are optimal design, computer-aided design, robust design, response surface design, mixture design, factorial design, block design, and designs for nonlinear models. GRA

N84-24489# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

DATA ENVELOPMENT ANALYSIS AND EXTENSIONS FOR DECISION SUPPORT AND MANAGEMENT PLANNING Ph.D. Thesis

C. T. CLARK May 1983 214 p
 (AD-A139430; AFIT/CI/NR-83-94D) Avail: NTIS HC A10/MF A01 CSCL 05A

The public expects military efficiency from the combat forces it supports with tax dollars. The United States Air Force needs integrative measures of efficiency and needs decision support systems which aid in detecting inefficiencies, diagnosing problems, and choosing among alternative courses of action to improve the efficiency and effectiveness of combat units. The Data Envelopment Analysis (DEA) technique developed by Charnes, Cooper and Rhodes provided the basic theoretical starting point for this dissertation. It enables the unified analysis of multiple technical, economic and effectiveness measures in contrast to past reliance by Air Force Management on partial measures of productivity, cost effectiveness, etc. Theory was extended by this study to provide analytical capabilities suitable for use by the Air Force in the analysis and interpretation of efficiency and in the preparation of management plans. This dissertation provided a basic theoretical framework for future development of decision support prototypes suitable for use by the Air Force in managing military effectiveness and efficiency. GRA

N84-24490# Army Research Inst. for the Behavioral and Social Sciences, Alexandria, Va.

AN OVERVIEW OF PRODUCTIVITY IMPROVEMENT EFFORTS IN ARMY ORGANIZATIONS

L. W. OLIVER and P. V. RIJN Feb. 1984 26 p
 (Contract DA PROJ. 2Q2-63743-A-794)
 (AD-A138589; ARI-RN-84-55) Avail: NTIS HC A03/MF A01 CSCL 05A

This paper presents an overview of the types of productivity improvement efforts being conducted in the Army. The activities of the formal Army programs, which are associated with comptroller offices, typically reflect the traditional industrial engineer approach stressing efficiency with relatively little emphasis on behavioral science concerns. An exception is the Productivity Enhancement, Measurement and Evaluation (EEMI) program which includes projects such as quality circles that are based on behavioral science principles and techniques. The activities of the Army's Organizational Effectiveness (OE) program do not usually make productivity improvement their principal focus, although productivity indicators may be used to evaluate OE operations. Examples are presented of Army productivity improvement projects based on behavioral science approaches. These include gainsharing, quality circles, and organizational interventions founded on sociotechnical systems theory. Problems encountered in the measurement of productivity are discussed, and a pilot study to develop and test measures of scientist/engineer productivity is also described. GRA

N84-24491# Illinois Univ., Urbana-Champaign. School of Architecture.

MODELS OF PURPOSIVE HUMAN ORGANIZATION: A COMPARATIVE STUDY Final Report, 1 Jun. 1981 - 30 Sep. 1982

E. L. MURPHREE, JR., R. M. DINNAT, N. CARREON, M. W. HARLESS, and B. W. ELLIOTT Alexandria, Va. Army Research Institute for the Behavioral and Social Sciences Feb. 1984 50 p

(Contract MDA903-81-M-4220; DA PROJ. 2Q2-63743-A-794)
 (AD-A138871; RN-84-64) Avail: NTIS HC A03/MF A01 CSCL 05A

The authors have previously presented a framework for a generic model of purposive human organization, based on relationships between pairs of resources, pairs of tasks, and resource-task pairs. This study compares the relational model, on the bases of conceptual foundations, function, and operation, with the socio-technical model. In addition to the theoretical comparison,

02 MANAGEMENT THEORY AND TECHNIQUES

a detailed example of a hypothetical organization is presented.

GRA

N84-24493# Texas A&M Univ., College Station. Dept. of Management.

THE NATURE AND USE OF FORMAL CONTROL SYSTEMS FOR MANAGEMENT CONTROL AND STRATEGY IMPLEMENTATION

R. L. DAFT and N. B. MACINTOSH Feb. 1984 63 p

(Contract N00014-83-C-0025)

(AD-A139083; TR-ONR-DG-06) Avail: NTIS HC A04/MF A01

CSCS 05A

Management control research from organization theory, accounting and business policy is reviewed, and a two-stage qualitative study of management control systems (MCS's) is reported. The study identified four MCS components--budget, policies and procedures, performance appraisal system, and statistical reports--that were used at the middle management level in business organizations. Each MCS component played a role during the control cycle of target setting, monitoring, and corrective feedback. The findings were used to propose two models - one model links the MCS to business-level strategy implementation, and the other model defines primary and secondary roles for MCS components in the management control process. Author (GRA)

N84-25353# Desmatics, Inc., State College, Pa.

RESEARCH ON FACTOR SCREENING IN COMPUTER SIMULATION Final Technical Report

C. A. MAURO and D. E. SMITH Mar. 1984 17 p

(Contract N00014-79-C-0650)

(AD-A139825; TR-113-15) Avail: NTIS HC A02/MF A01 CSCS 12A

The object of this research program has been to evaluate and compare the performance of factor screening procedures for use in computer simulation experiments. Factor screening methods are statistical methods that attempt to identify, efficiently and economically, the set of most important factors. Once the most important factors have been identified, further simulation (or real-world) experimentation can focus on these particular factors. This eliminates experimentation with relatively unimportant factors, which can needlessly consume resources. This report briefly discusses the problem background, summarizes the research goals, and provides a reference list of all technical reports, journal publications, and presentations prepared under this contract.

GRA

N84-25403# National Research Inst. for Mathematical Sciences, Pretoria (South Africa).

INTERACTIVE DECISION ANALYSIS AND MODELLING

T. J. STEWART, ed. Jan. 1983 269 p refs Presented at the NRIMS Summer Seminar Series, Pretoria, 7-9 Feb. 1983

(CSIR-TWISK-294) Avail: NTIS HC A12/MF A01

The lectures fall into two categories. The first category surveys the field of multiple criteria decision making and developments therein. The second category deals more with computer interaction in the design, construction and implementation of decision support models. M.A.C.

N84-25503 International Inst. for Applied Systems Analysis, Laxenburg (Austria).

DECISION SUPPORT FOR INNOVATION MANAGEMENT: APPLICATION TO THE LIGHTING INDUSTRY

H. D. HAUSTEIN and M. WEBER Dec. 1983 75 p refs

(IIASA-RR-83-29; ISBN-3-7045-0058-5) Avail: Issuing Activity

In today's turbulent economic environment, every decision affecting the development of industry necessarily carries an increased risk that the anticipated economic and social goals will not be achieved. The description of decision making does not always include the notion of risk. Sometimes the volatility of cost factors or changing economies of scale (innovation being the primary reason for the change) are held responsible for uncertainty about future development. These phenomena are also used to explain the decline in capital formation and in decisions to invest

that we are currently witnessing. The economic and decision sciences are trying to cope with this situation by devising more sophisticated methods and procedures for supporting decision making. Methods that are applicable to the analysis of innovation patterns, with the aim of basing the necessary decision on more sound reasons are reviewed. The application of some of these methods to innovation management in the lighting industry are described. Author

N84-26001 Case Western Reserve Univ., Cleveland, Ohio.

OPTIMIZATION METHODS IN HIERARCHICAL HOLOGRAPHIC MODELING Ph.D. Thesis

J. THADATHIL 1983 406 p

Avail: Univ. Microfilms Order No. DA8405260

The mathematical formulation of the hierarchical holographic modeling and solution methodology are explored. The hierarchical multiobjective optimization (HMO) methods that have been developed so far are useful mostly for the analysis of large scale systems which are controlled and managed by one planning group only. The mathematical representation of the HHM in a generic case and the effects of multiple decompositions on the decision vectors, multiobjective vectors and constraints vectors in three HHSubmodel cases are explored. The solution methodology of two hierarchical holographic submodels (HHS) is considered. Two algorithms, namely the Hierarchical Holographic Overlapping Coordination algorithm and the Hierarchical Holographic Feasible scheme are proposed for generating pareto optimal solutions of the HHSs. The coupling resource allocation problem faced by the upper level group, between two HHSs is addressed. The applicability of the HHM scheme to a hypothetical river basin related land resource management problem is explored. Author

N84-26345# Massachusetts Univ., Amherst. Dept. of Electrical and Computer Engineering.

RESEARCH IN ADAPTIVE CONTROL HYBRID AND CONSTRAINED STRUCTURE SYSTEMS Final Scientific Report, 1 May 1980 - 31 Aug. 1983

T. E. DJAFERIS 17 Oct. 1983 7 p

(Contract AF-AFOSR-0155-80; AF PROJ. 2304)

(AD-A140496; AFOSR-83-1122TR) Avail: NTIS HC A02/MF A01 CSCS 05A

Stable Hybrid Model Reference Adaptive Control Algorithms are suggested which are then extended to deal with the presence of bounded disturbances. The question of unmodelled dynamics is also addressed. Simpler adaptive control algorithms are developed in the context of pole placement, by first considering systems with known parameters. Such algorithms do not require a minimum phase assumption. The foundation is laid for a much broader investigation of robust design methods for systems with structured uncertainties. Author (GRA)

N84-26429* National Aeronautics and Space Administration, Washington, D. C.

MANAGEMENT. A CONTINUING BIBLIOGRAPHY FOR NASA MANAGERS, WITH INDEXES

Mar. 1984 150 p

(NASA-SP-7500(18); NAS 1.21:7500(18)) Avail: NTIS HC \$16.00 CSCS 05A

This bibliography lists 594 reports, articles and other documents introduced into the NASA scientific and technical information system in 1983. Author

N84-27591# Naval Postgraduate School, Monterey, Calif.

THE INTRODUCTION OF UNCERTAINTY TECHNIQUES TO THE PRODUCTIVITY INVESTMENT FUND M.S. Thesis

E. A. LENIO Mar. 1984 130 p

(AD-A140864) Avail: NTIS HC A07/MF A01 CSCS 05A

Each year the Defense Productivity Program Office (DPPO) disburses funds for Productivity Investment Projects (PIFs). The purpose of these projects is to increase productivity within the Department of Defense (DOD). To enhance these efforts, DPPO requested a study to be conducted to determine if methods of risk or uncertainty will affect the results obtained by the current

procedure. This study applies various principles of uncertainty to this procedure and examines their impact on the project rankings. A background of DPPO and PIFs is presented together with discussion of risk and uncertainty techniques, as well as the economic indicators used in ranking projects. A model is then explained which will introduce uncertainty into the present procedure. Results of the initial comparison and sensitivity analysis is revealed. Conclusions are drawn based on these results and recommendations concerning alternate procedures and possible further research are presented. Author (GRA)

N84-27592# Naval Postgraduate School, Monterey, Calif.

CONTROL SYSTEMS M.S. Thesis

J. M. MARTIN Dec. 1983 56 p

(AD-A140901) Avail: NTIS HC A04/MF A01 CSCL 05A

Managers are responsible for identifying the need for control and for designing control systems that are appropriate for each set of conditions. This thesis examines the nature of organizational control and discusses historical approaches to organizational control. Structural and behavioral control system theories are presented and analyzed. Four alternatives to control system design are documented and an approach to control system design is offered. Author (GRA)

N84-27593# Technische Hochschule, Aachen (West Germany). Schriften zur Informatik und Angewandten Mathematik.

STOCHASTIC BOUNDS ON DISTRIBUTIONS OF OPTIMAL VALUE FUNCTIONS WITH APPLICATIONS TO PERT, NETWORK FLOW AND RELIABILITY

G. WEISS (Tel Aviv University) Oct. 1982 27 p refs Sponsored by DAAD

(REPT-81) Avail: NTIS HC A03/MF A01

Networks or general clutters with nodes $1, \dots, n$, paths l_1, \dots, l_k , cuts J_1, \dots, J_l , and with random weights X_1, \dots, X_n possessing marginal distributions F_1, \dots, F_n are considered. For the optimal value functions M , L , and T , (critical path length, the maximal flow and the system lifetime) random variables such that M bar sup is convexly larger, L bar sub concavely smaller, T bar sup (sub) stochastically larger (smaller) than M , L , T respectively, over all joint distributions with the given marginals are constructed. These bounds are sharp and can be obtained by solving relatively easy mathematical programs. Author (ESA)

N84-27595 Missouri Univ., Columbia.

AN INVESTIGATION OF ORGANIZATIONAL CLIMATE: DEFINITION, MEASUREMENT, AND USEFULNESS AS A DIAGNOSTIC TECHNIQUE Ph.D. Thesis

P. R. ASH 1983 154 p

Avail: Univ. Microfilms Order No. DA8406168

An investigation is made of the relationships between personality and perception of organizational climate, as well as the relationships between level in the organization and perception of organizational climate. Also, evidence of an organization specific dimension of climate is investigated and measurement of this dimension attempted through the use of questionnaires. A more detailed investigation of two personal correlates of organizational climate personality and position in the organization is discussed. The EPPS personality characteristics - autonomy, dominance, and achievement - accounted for almost 22% of the variation in perceived organizational climate. Those managers with relatively high EPPS scores in the personality characteristics of achievement, aggression, autonomy, and dominance, were found to perceive their organizational climate to be comparatively negative. Managers with high scores in the personality characteristics of affiliation, succorance, and order were observed to perceive their organizational climate to be relatively positive. Dissert. Abstr.

N84-27596 Pennsylvania Univ., Philadelphia.

EVALUATING ORGANIZATIONAL CHANGE THROUGH IMPROVED UNDERSTANDING OF MANAGERIAL SCHEMATA Ph.D. Thesis

P. W. HOWARD 1983 508 p

Avail: Univ. Microfilms Order No. DA8406675

As organizational situations become increasingly complex, the essential connection between how researchers and managers interpret them becomes increasingly difficult to make. It is hypothesized that managerial schemata serve as the basis for understanding how managers perceive the success of planned organizational change and can reveal indices of success useful to managers but not necessarily obvious to researchers. These hypotheses are tested by applying the theoretical system to the application of an extensive Management By Objectives program in a large federal agency. Interview and survey data were gathered from seventy-two senior managers within sixteen different organizations in the agency to determine what issues were important from their perspectives for the success of the program and how the issues were related to one another. A model comparison approach is used to test the hypotheses and the extent to which managerial schemata do indeed exhibit rational and causal contraventions and yield useful indices of success for the MBO program. Dissert. Abstr.

N84-27597 Virginia Polytechnic Inst. and State Univ., Blacksburg.

AN ANALYSIS OF RELATIONSHIPS AMONG SIZE, TECHNOLOGY AND STRUCTURE IN A CONTEXTUALLY LIMITED SETTING Ph.D. Thesis

J. K. WORLEY 1983 134 p

Avail: Univ. Microfilms Order No. DA8405948

For several years organization theorists have debated the magnitude of the impact of size and technology on dimensions of organization structure. Also, management theorists have shown the importance of structure on organization goal attainment. However, no consensus was reached concerning the interrelationship among size structure and technology. Apparently much of the disagreement among theorists is a result of mixing levels of analysis, inadequate specification of variables, use of inadequate or inappropriate research tools and lack of controls for potentially confounding variables. The purposes were: (1) to provide a better understanding of the complex interrelationships among size, technology and structure; (2) to use regression analysis in an effort to better depict the relationships among those variables; and (3) to attempt to bridge some of the findings of other researchers that disagree among themselves. Dissert. Abstr.

N84-28404# Mitre Corp., Bedford, Mass.

ENVIRONMENTS FOR EVALUATING PERFORMANCE OF C3I (COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE) SYSTEMS

E. J. KIRK /In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 4-8 Apr. 1984

(AD-P003237) Avail: NTIS HC A99/MF A01 CSCL 05J

Some environments and methods which have been used to evaluate C3I (Command, Control, Communications and Intelligence) systems are outlined. A series of specific controlled tests that were conducted during recent (1982-83) developmental tests of Joint Service message standards are also described. This type of test may be seen as a cost-effective method to evaluate certain system capabilities in addition to or in place of large-scale field tests. GRA

N84-28413# Texas A&M Univ., College Station.

FACTOR STABILITY AND CONSTRUCT VALIDATION OF YUKL'S MBS (MANAGERIAL BEHAVIOR SURVEY) FOR MILITARY LEADERSHIP

D. D. VANFLEET and G. A. YUKL /In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 49-52 Apr. 1984

(AD-P003246) Avail: NTIS HC A99/MF A01 CSCL 05J

The purpose of this paper is to present some evidence regarding the factor stability and construct validity of the new taxonomy for

02 MANAGEMENT THEORY AND TECHNIQUES

military leadership. In doing this, a second step will be taken in that a comparative analysis of data from two points in time will be performed rather than merely using cross sectional data as in the past. The data presented here strongly suggest that Yukl's Managerial Behavioral Survey (MBS) possesses both factor stability and construct validity as well as previously demonstrated reliability. This means that the MBS can, indeed, be used with military samples to extend our knowledge about effective leader behavior. Such extensions will be even more meaningful, of course, if the research strategies used go beyond single method, single time strategies. If future research will use this more realistic, complex taxonomy in more useful and more complex research strategies, much can be learned about leadership in general and military leadership in particular which can be particularly useful in selection, evaluation, training, and development of future military officers. GRA

N84-28414# Montana State Coll., Bozeman. Engineering Experiment Station.

EXPLORING THE INTERACTION OF THE VROOM/YETTON MODEL AND LEADERSHIP STYLE (LPC) (LEAST PREFERRED COWORKER) AS IT PREDICTS PERFORMANCE

R. M. MCDANNELL and S. C. MARCY *In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 53-57 Apr. 1984* (AD-P003247) Avail: NTIS HC A99/MF A01 CSCL 05J

The purpose of this research is to explore the relationship between leaders' decision-making behavior on the Vroom/Yetton problem set and performance in an actual organizational setting. Additionally, leadership style as measured by Fiedler's Least Preferred Coworker (LPC) scale is tested as a personality variable that may moderate the problem set to actual leader performance relationship. A group of 98 third year cadets at the U.S. Military Academy were administered a military version of the Vroom/Yetton thirty problem set and Fiedler's LPC scale. Military development ratings made by their Tactical Officers were used as measures of their performance. Results suggest that information resulting from their performance on the problem set is related to their performance evaluations in an actual setting. Additionally, the magnitude of the relationship is larger for low LPC cadets and disappears for high LPC cadets. GRA

N84-28415# Montana State Coll., Bozeman. Engineering Experiment Station.

SUBORDINATE PERCEPTIONS OF CONTINGENT LEADERS: DO FOLLOWERS ACCEPT OUR THEORIES?

J. H. CAGE *In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 58-62 Apr. 1984* (AD-P003248) Avail: NTIS HC A99/MF A01 CSCL 05J

Two studies were conducted to investigate assumptions made by contingent leadership theorists about subordinates. Paper and pencil instruments provided situations in which a leader followed or failed to follow the prescription of Vroom's contingency theory. Subjects were asked to take the role of subordinate, evaluate the decision making process, offer prognosis about the outcomes, and assess the leader. Three groups of subjects were identified by their responses. Only one of the three groups accepted the leader when s/he acted according to the prescription of contingency theory. The groups were differentiated by characteristics such as income, occupational prestige, and number of subordinates. The findings suggest that individuals, while acting as subordinates, may fail to accept the prescription of contingency theory. GRA

N84-28416# Yale Univ., New Haven, Conn.

TO THE WILDERNESS AND BEYOND: THE APPLICATION OF A MODEL FOR TRANSFORMAL CHANGE

R. C. GINNETT *In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 63-67 Apr. 1984* (AD-P003249) Avail: NTIS HC A99/MF A01 CSCL 05J

Much of the ongoing management and development in modern organizations could be considered transactional in nature, and as long as the organization is operating reasonably effectively and efficiently, this style may be most appropriate. However, there may also be organizations in which transformatal leadership or development is needed. A model for transformatal change was

applied in such an organization with qualitatively successful outcomes. The model and its application are described as well as a discussion of the dilemma of evaluation for efforts of this nature. Author (GRA)

N84-28448# Military Academy, West Point, N. Y.

THE ROLE OF RELEVANT EXPERIENCE AND INTELLECTUAL ABILITY IN DETERMINING THE PERFORMANCE OF MILITARY LEADERS: A CONTINGENCY MODEL EXPLANATION

P. J. BETTIN *In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 338-342 Apr. 1984* (AD-P003303) Avail: NTIS HC A99/MF A01 CSCL 05J

A field study involving 79 army combat officers in middle echelon leadership positions was conducted to evaluate the role of relevant experience and intellectual ability in predicting leadership performance. Biographical and organizational data were the primary measures used to ascertain the relevance of leader experience. This represents a departure from previously used methodology which considered only the leaders' organizational tenure in determining experience levels. Results shed light on the components of Fiedler's Contingency Model of Leadership Effectiveness supporting the hypothesis that task- and relationship-motivated leaders make effective use of their experience only in situations which match their leadership personality. The study also suggests a plausible relationship between the leader's cognitive resources and leader behaviors. Author (GRA)

N84-28466# Wisconsin Univ., Stevens Point. Cooperative Fishery Research Unit.

TRAINING DECISION-MAKERS TO BE CREATIVE: A MANAGEMENT PROCESS MODEL

B. A. MARTIN, K. STROM-GUZOWSKI, and R. L. TAYLOR *In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 595-599 Apr. 1984* (AD-P003347) Avail: NTIS HC A99/MF A01 CSCL 05A

The predictable structure of our military bureaucracies reinforce traditional decision-making processes. At the same time, complex technologies and environments suggest more creative decisions. This research focuses on how experienced decision-makers can be trained to be more creative. Our purpose is twofold. First we examine how decisions are made. Examining models of decision making may help us to better understand the nature of what we do and where creativity fits in. Second our task is to study the research in creativity, developing a model that relates it to decision making. The major focus is integrating the two models--decision-making and creativity--in a theoretical framework. This is a first step; before a training program can be developed, the theoretical roots must be verified. GRA

N84-28468# Air Force Academy, Colo.

LEADERSHIP, MANAGERSHIP, AND COMPUTERS IN TODAY'S AIR FORCE

W. E. MCCARRON and D. R. HARVEY *In its Proc. of the 9th Symp. on Psychol. in the DOD p 615-619 Apr. 1984* (AD-P003351) Avail: NTIS HC A99/MF A01 CSCL 05E

Managership is quantifiable and measureable while leadership is qualitative and personal. Though the two concepts are not opposed to each other, there are differences. This paper discusses specific Air Force situations to show that leadership extends beyond managership, particularly in computer applications areas. For a mere manager, computers make decisions; for a leader a computer is only one tool in decision-making. Exclusive managership leads to narrow thinking and predictable tactics. Leadership includes people, weapons, and a consequent dynamism which yields innovative thinking and tactics. Author (GRA)

N84-28665# McBer and Co., Boston, Mass.

ORGANIZATIONAL STRUCTURES, PROCESSES, AND PROBLEMS: A LITERATURE REVIEW AND TAXONOMY Final Report

A. BHAMBRI, M. M. DALZIEL, and S. A. WILLIAMSON May 1984 95 p

(Contract MDA903-80-M-8914; DA PROJ. 2Q2-63731-A-792)

(AD-A140979; ARI-RN-84-72) Avail: NTIS HC A05/MF A01

CSCS 05A

This report provides a limited review of the literature on organizational structure, processes, and associated problems that are amenable to diagnosis and remediation by either leaders or organizational consultants. Within this limited scope, dominant technology impact on structure and process is discussed, and guidelines are provided for the development of a strategy of organizational diagnosis focusing on either structure or organizational process antecedents.

Author (GRA)

N84-29437# Arizona Univ., Tucson. Coll. of Business and Public Administration.

INFORMATION SEARCH IN JUDGMENT TASKS: THE EFFECTS OF UNEQUAL CUE VALIDITY AND COST Interim Technical Report

T. CONNOLLY and P. SERRE May 1984 31 p

(Contract N00014-83-K-0742)

(AD-A141712; ONR-84-1) Avail: NTIS HC A03/MF A01 CSCS

05A

The broad question addressed by this research is: How good are humans at balancing the costs and benefits of their information acquisition? Do they buy those, and only those, sources of information whose acquisition cost is outweighed by the improvement in decision quality that their use makes possible? The evidence reported here, together with that reviewed earlier, suggests that the answer is not encouraging. Specifically, the present findings extend those noted earlier in suggesting: (1) That the pattern of overpurchase for low-consequence decisions, and underpurchase for high-consequence decisions, is robust to variation in overall cue validity, as well as to procedural modifications such as manual versus computer-interactive transactions (Experiment 1), (2) That overpurchase is frequently coupled with mispurchase (Experiments 2 & 3). That is, subjects, in addition to buying overall more information than was normatively justified, frequently bought expensive cues when cheap, equally-valid ones were available (Experiment 2), or low-validity cues when higher-validity, equally-costly cues were available (Experiment 3), (3) That subjects perceive equally-valid cues as of differential validity (Experiments 1 & 2), and are able to detect real validity differences between cues reliably only when the differences are large (Experiment 3). Purchase behavior is generally shaped by these perceptions of validity, whether well-founded or not, though the relationship disappears when equally-valid cues are offered at different costs (Experiment 2).

GRA

N84-30709# Technische Hogeschool, Delft (Netherlands).

FAULT MANAGEMENT

W. THIJS *In its* Man-Machine Systems Group p 80-99 Sep.

1983 refs Sponsored by Organization for Applied Scientific Research TNO and Institute for Mechanical Constructions

Avail: NTIS HC A13/MF A01

Cognitive, behavioristic and normative approaches to fault management in industrial processes are outlined. The cognitive approach is descriptive, speculative and very general. The behavioristic approach is descriptive and task specific. The normative approach is prescriptive, and is based on Savage's normative decision theory. This theory concerns the selection of acts out of a set of possible acts in such a way that the expected utility of the consequences is maximized. Possible states of the world, how alternative actions relate consequences to these possible states, and how the gravity of the different consequences may be compared are considered. The uncertainty of these items is expressed in a subjective or personal probability.

Author (ESA)

N84-30717# Massachusetts Inst. of Tech., Cambridge. Lab. for Man-Machine Systems.

INTERACTION OF HUMAN COGNITIVE MODELS AND COMPUTER-BASED MODELS IN SUPERVISORY CONTROL

T. B. SHERIDAN Mar. 1984 55 p

(Contract N00014-83-K-0193)

(AD-A142677) Avail: NTIS HC A04/MF A01 CSCS 05H

This report summarizes the first year's effort of a three-year research project on how knowledge is represented in decision aids and control systems and how the operators of such systems apparently represent and utilize such knowledge. The first section of the report discusses the relationship of computer-based supervisory control to computer-based decision-aiding (expert systems) by identifying component variables and functions and building up block diagrams. The second section deals quantitatively with internal models, knowledge, and calibration, both with respect to expectations of the existence of identifiable states of the world and with respect to the overlap of meanings of terms (mental or linguistic encodings, fuzzy variables). The third section discusses mental models and their importance in three kinds of activities supervisors must do in complex systems: (1) discovering how things work; (2) determining what is wanted out of the set of alternatives states of the attributes; (3) encoding and manipulating fuzzy concepts; (4) combining evidence and confidence; and (5) deciding what to do. The fourth section of the report deals with the human use of computer-based models in automatic control and in decision-aiding.

GRA

N84-31035# Leadership and Management Development Center, Maxwell AFB, Ala.

A FIELD STUDY OF AIR FORCE ORGANIZATION STRUCTURES Final Report

E. J. CONLON, R. L. DAFT, J. S. AUSTIN, and L. O. SHORT May 1984 86 p

(AD-A142389; LMD-TR-84-4) Avail: NTIS HC A05/MF A01

CSCS 05A

Changes in the political, social, economic, and technological environments of organizations have provided an increasingly turbulent context within which organizations must operate. One consequence of these changes is growing concern with developing structural forms which adapt more easily. The Air Force has also become interested in this issue and has requested study focusing on some non-traditional options to more traditional functional structure. This paper reports results of a pilot work for this effort. Included are a discussion of the importance of structure, theoretical models for structural variations and alternatives, a methodology which can be used to study structural issues, and an application of both methodology and theory to specific Air Force situations (aircraft maintenance and systems acquisition). Discussion is provided by answers to specific questions regarding structural issues in the Air Force.

GRA

N84-31037# Michigan Univ., Ann Arbor. Inst. for Social Research.

A MODEL OF INTER-ORGANIZATIONAL INFLUENCES ON ORGANIZATIONAL PROCESSES Final Technical Report

D. G. BOWERS and A. S. DAVENPORT Jun. 1984 196 p

(Contract MDA903-79-C-0330; DA PROJ. 2Q1-62717-A-779)

(AD-A142450; ARI-RN-84-91) Avail: NTIS HC A09/MF A01

CSCS 05A

The purpose of this research was to look for the critical source/sources of variance in local Army unit functioning as measured by leader performance and unit effectiveness. The research question was whether the primary source/sources of inter-unit differences were to be located at the division, brigade, battalion, or company level; or were to be explained on the basis of the people who make them up. Findings were that the primary source of variance was to be found in the people themselves, particularly their education and race. Also that the division to which the company belongs and battalion function have some effect, but much less than the companies themselves. Brigades and battalions were found to have little or no impact on organizational climate. Another finding was that demographic effects do not rise

02 MANAGEMENT THEORY AND TECHNIQUES

in importance when company rather than individual-level data are considered. While various models of organizational functioning were used, the integrated model, which encompasses portions of both the traditional and collaborative models, was found to have the most power in explaining the variance found in this data set. Results suggest that unit effectiveness will be maximized when units are: (1) composed of persons with some amenability to structure and direction and some respect for legitimate authority, and (2) commanded or led by a style which is collaborative or participative. Author (GRA)

N84-32268# Wisconsin Univ., Madison. Mathematics Research Center.
EQUITABLE ASSIGNMENT RULES Technical Summary Report
P. W. GLYNN and J. L. SANDERS May 1984 38 p
(Contract DAAG29-80-C-0041)
(AD-A142809; AD-E401119; MRC-TSR-2685) Avail: NTIS HC A03/MF A01 CSCL 12A

This paper investigates the formalization of an important class of management decision problems. The problems considered are those of making equitable workload assignments to personnel. The paper proposes a series of intuitively appealing assignment rules, including random assignment, fixed assignment, block rotation and rules that reverse inequities caused by the last period's assignments. It is shown that in the two-person case none of these rules satisfies the simple criterion that cumulative differences of workload assignments among personnel become and remain small. Differences in the properties of these rules are investigated under three additional but less strenuous criteria. It is shown that a new assignment rule called the counter-current rule does satisfy the criterion stated above; further, it is shown that it is an optimal rule under a fairly weak set of requirements. The extension of the results from the two-person case to the n-person case is discussed briefly and some initial results are presented. GRA

N84-33138# National Academy of Sciences - National Research Council, Washington, D. C.
WORKSHOP ON SYSTEMS ANALYSIS Final Summary Report
Apr. 1984 115 p Workshop held in Jakarta, Indonesia, 8-12 Feb. 1983
(PB84-194661; R-84-2) Avail: NTIS HC A06/MF A01 CSCL 12B

The use of systems analysis S/A is given as a tool for attaining development goals. Particular focus is given to illustrative studies focusing on Indonesian concerns with solid waste management, urban transportation, and the food system. Addressing these concern are scientists, engineers, development specialists, administrators and educators. GRA

N84-33253# Air Command and Staff Coll., Maxwell AFB, Ala.
MATRIX MANAGEMENT IN DOD: AN ANNOTATED BIBLIOGRAPHY
D. A. WIEDERHOLD Apr. 1984 40 p
(AD-A143316; ACSC-84-2780) Avail: NTIS HC A03/MF A01 CSCL 05A

This report collectively examines the department of defense's (DOD) literature about matrix management from 1973 to spring 1984. This report also annotates 36 references and classifies them by: (1) author's opinion, experience; (2) literature review; (3) data/survey results; and (4) official guidance. The document discusses general impressions regarding each group and provides synthesis. B.W.

N84-33293# Texas A&M Univ., College Station. Dept. of Management.

AN EXPLORATORY ANALYSIS OF THE RELATIONSHIP BETWEEN MEDIA RICHNESS AND MANAGERIAL INFORMATION PROCESSING

R. H. LENGEL and R. L. DAFT Jul. 1984 73 p

(Contract N00014-83-C-0025)

(AD-A143503; TR-DG-08-ONR) Avail: NTIS HC A04/MF A01 CSCL 17B

A dilemma exists between technical information designers and students of managerial information behavior. A richness model is proposed that uses the concepts of media richness and communication learning requirements to integrate the two perspectives. The concepts and model were tested in a four-stage research program, and they were generally supported. Managers tended to prefer rich, oral media when learning requirements were high and less rich, written media when learning requirements were low. Author (GRA)

N84-34191# Intelligent Software Systems, Inc., Amherst, Mass. **A SYSTEM FOR EMBEDDING DATA DISPLAYS IN GRAPHICAL CONTEXTS**

A. C. MORSE Jul. 1984 38 p Prepared in cooperation with Visual Intelligence Corp., Amherst, MA

(Contract N00014-83-C-0495; R18-688)

(AD-A143630; TR-84-7-1) Avail: NTIS HC A03/MF A01 CSCL 09B

This report describes an interactive computer tool for data analysis that facilitates the graphical encoding of both the data and the domain-related cues. That is, the system allows the decision-maker to draw figures (e.g., schematics) that depict the problem domain, and to embed dynamic data displays within those figures. (For instance, the system enables the user to draw the schematic of a process and insert data displays - dials, strip charts - at various points in the schematic.) These dynamic data displays can either be selected from a library of predefined display formats (e.g., bar chart), including several formats not usually found in graphing packages (e.g., face display), or they can be created interactively by the user. To accomplish the latter, the systems includes the ability to define dynamic attributes of graphical objects, where the attributes change as a function of the data being analyzed. Author (GRA)

N84-34308# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).

DIFFICULTIES OF SCIENTIFIC AND TECHNOLOGICAL PLANNING [DIFICULDADES PARA PLANEJAR CIENCIA E TECNOLOGIA]

W. RUIZ Jun. 1983 11 p In PORTUGUESE Presented at the 7th Simposio Nacl. de Pesquisa em Administracao de Ciencia e Tecnologia, Realizado em Sao Paulo, nos dias 24-26 Nov. 1982 e Promovido Pelo PACTO - IA/FEA/USP

(INPE-2786-PRE/352) Avail: NTIS HC A02/MF A01

Problems involved in scientific and technological planning are examined. The components of planning, implementation and control of planning, and deficiencies of scientific endeavors are discussed. Some of the common problems resulting in deficient planning are: (1) failure to articulate intellectual requirements; (2) insufficient knowledge of methodology; (3) lack of clarity of plans; and (4) unclear objectives, monitoring, enforcement, and communication. Successful execution of a plan entails detailed description of the final product, listing of methods to be used to achieve desired results, satisfying clientele, timely completion of the project, and project completion within the allotted budget. Transl. by B.G.

**N84-34644# Joint Publications Research Service, Arlington, Va.
DECISION-MAKING PROCESS IN MANAGEMENT
AUTOMATION**

Y. I. VOROBYEV *In its* USSR Rept.: Machine Tools and Metalworking Equipment (JPRS-UMM-84-017) p 29-34 25 Sep. 1984 Transl. into ENGLISH from Mashinost. (Moscow), no. 3, Mar. 1984 p 38-40
Avail: NTIS HC A03

The impact of management techniques on automatic production control is examined. The decision making process is described with emphasis on production efficiency, and interrelated, automated, subsystems. The roles of data processing, organizational analysis, and personnel management in decision making are also discussed. M.A.C.

03

INDUSTRIAL MANAGEMENT AND MANUFACTURING

Includes Industrial Management, Engineering Management, Design Engineering, Production Management, Construction, Aerospace/Aircraft Industries, Manufacturing.

A84-10399#

THE INDUSTRIAL JUST RETURN PRINCIPLE [LE PRINCIPE DE 'JUSTE RETOUR INDUSTRIEL']

J. BOUILLET (ESA, Departement des Contrats, Paris, France) ESA Bulletin (ISSN 0376-4265), no. 35, Aug. 1983, p. 70-75. In French.

Methods for ensuring a just share for government and industries participating in ESA space projects are outlined. A global technique involves determining, at the signing of contracts, the exact percentage shares in the specific project to be undertaken, with consideration given to annual inflation rates in each country. Shares are modified on the basis of the percentage of commonly shared equipment and the need to fund ESA operations. A formulation has been devised for assigning a coefficient of participation to the signatories supporting each project. It is noted that over the cost of a program contracts are assigned to subcontractors and also that adjustments in shares are needed due to a changing level of participation, both in the projects and ESA, and to modifications in the scales of participation. M.S.K.

A84-11274

THE FINE ART OF ACCEPTING AN AIRLINER

W. H. GOODMAN Exxon Air World, vol. 35, no. 2, 1983, p. 12-18.

The management practices typical of airline acceptance of new aircraft from a manufacturer are presently exemplified by Air Europe's relationship with Boeing during the assembly and predelivery inspections of a 757 airliner. The airline's representative will, over the five and one-half months from keel-laying to flyaway, search for fabrication and assembly details that do not conform to the aircraft's engineering drawings as well as for accurately executed design features which may give rise to problems during aircraft operation or maintenance. Minor design changes are in the latter case incorporated. O.C.

A84-15319

DESIGN TO COST [LA CONCEPTION ACOUT OBJECTIF]

C. PETITDEMANGE (Centre National d'Etudes Spatiales, Evry, Essonne, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 545-582. In French.

The decisions which will be necessary in order to direct the Arianespace activities to cost-effective, commercial development of industrial-scale production of hardware for launch vehicles and satellites are discussed. A master program is described, setting

goals, financial sources, accounting for delays, and assigning responsibilities. Each subprogram will require a feasibility study that will also consider the program organization. Technical reviews will be performed of necessary technologies and of the capabilities of current industrial concerns to produce the desired hardware alone and in cooperation. The stage of mass production will only be reached when the industries have submitted documentation of their abilities to produce the hardware on a design-to-cost basis. It is stressed that detailed design studies are required before granting the production contracts in order to assure that the components and systems can actually be manufactured cost-effectively, with acceptable modifications, with the existing materials, expertise, and industrial capabilities. M.S.K.

A84-19449*

AEROSPACE TECHNOLOGY AND COMMERCIAL NUCLEAR POWER; PROCEEDINGS OF THE WORKSHOP CONFERENCE, WILLIAMSBURG, VA, NOVEMBER 18-20, 1981

J. GREY, ED. Workshop Conference sponsored by AIAA, U.S. Department of Energy, NASA, et al. New York, American Institute of Aeronautics and Astronautics, 1982, 150 p.
(Contract NRC-G-04-81-002; DE-FG01-82NE-37887)

An attempt has been made to compare the technologies, institutions and procedures of the aerospace and commercial nuclear power industries, in order to characterize similarities and contrasts as well as to identify the most fruitful means by which to transfer information, technology, and procedures between the two industries. The seven working groups involved in this study took as their topics powerplant design formulation and effectiveness, plant safety and operations, powerplant control technology and integration, economic and financial analyses, public relations, and the management of nuclear waste and spent fuel. Consequential differences are noted between the two industries in matters of certification and licensing procedures, assignment of responsibility for both safety and financial performance, and public viewpoint. Areas for beneficial interaction include systems management and control and safety system technology. No individual items are abstracted in this volume O.C.

A84-22344#

PROFITABILITY OF MANUFACTURING IN SPACE IN VIEW OF LUNAR INDUSTRIAL DEVELOPMENT AND GEO-SOCIO-ECONOMIC BENEFITS

K. A. EHRLICHE (Space Global Co., La Jolla, CA) IN: Manufacturing in space; Proceedings of the Winter Annual Meeting, Boston, MA, November 13-18, 1983. New York, American Society of Mechanical Engineers, 1983, p. 183-198. refs

Comprehensive industrialization of cislunar space for humanity and earth's biophil environment can evolve only through utilization of the technophil lunar environment and its resources. The high O₂-content renders about 6/7 of O₂/H₂ propellant for cislunar traffic available at a fraction of the energy needed for terrestrial supplies, resulting in high cost savings that can speedily supersede the cost of lunar operations if cost-effectiveness, day/night productivity and growing self-sufficiency are stressed in lunar development. A two-phase transportation system development for low-cost surface access and concepts for the selection and installation of nuclear power plants are presented. Examples are given for the growth of space manufacturing and the enhancement of its profitability through improved availability of oxygen, raw materials in various forms, semi-finished and finished products. Author

A84-24632#

ROLE OF A SPACE STATION IN PHARMACEUTICAL MANUFACTURING

J. T. ROSE (McDonnell Douglas Astronautics Co., St. Louis, MO) IN: Space station: Policy, planning and utilization; Proceedings of the Symposium, Arlington, VA, July 18-20, 1983. New York, American Institute of Aeronautics and Astronautics, 1983, p. 79-84.

The impact of the proposed space station on the commercial manufacture of pharmaceuticals is discussed, with a focus on the

prototype program (using electrophoresis) being developed by McDonnell Douglas in cooperation with the Ortho Pharmaceutical Corporation and NASA. The commercial organization of the program is outlined, and the successful production tests carried out with the STS are briefly described and illustrated with photographs and drawings. First test flight of a production-scale prototype is planned for 1985, to be followed by an unmanned-free-flyer program and/or manned production on the space station. The economic advantages of the manned mode are seen in ease of maintenance, lower transportation costs (raw materials and products only rather than whole vehicles or modules), and more rapid development of new products. T.K.

A84-32774

EVOLUTION IN AEROSPACE ENGINEERING ORGANISATION

J. T. STAMPER Aerospace (UK) (ISSN 0305-0831), vol. 11, April 1984, p. 5-14.

An historical account is given of the growth and changing structure of aeronautical design engineering organizations, with attention to the character of such structures before and after the Second World War in Great Britain. While a typical prewar design organization encompassed only 50-100 staff members, the early 1950s witnessed a growth in staff to 300-500 members, and by the end of that decade, 500- to 1000-member staffs were required to effectively cope with the complexity of such projects as the Comet, which was the world's first jet airliner. The pyramidal scheme of engineering design organizations also underwent considerable change, ultimately yielding to a 'matrix' organizational structure. O.C.

A84-38468#

THE WORKLOAD OF EUROPEAN SPACE INDUSTRY - CURRENT SITUATION AND FORESEEABLE TRENDS

G. DONDI (ESA, Directorate of Administration, Paris, France) and M. TOUSSAINT (Eurosace, Paris, France) ESA Bulletin (ISSN 0376-4265), no. 38, May 1984, p. 31-35.

The results of a 1983 survey of 51 space-industry firms in 12 European countries on their interfirm cooperative connections, employment characteristics, and workload are summarized and illustrated with graphs and tables. The firms surveyed employ 51 percent of the 31,000 Europeans engaged in space activities and report an average increase of 7 percent/yr for the period 1977-1983 despite some recruitment problems. The total turnover during the period grew by 16.7 percent/yr and is predicted to grow by 12.3 percent/yr during 1984-1988. The more rapid growth of the firms' commercial sales (44 percent/yr for 1977-1983) is expected to continue: the shares of ESA, national, and commercial contracts are predicted as 33, 22, and 45 percent, respectively, for 1988. For the space community as a whole (including the national space agencies, ESA itself, and the university and institutional laboratories), however, the predicted shares are 40, 30, and 30 percent. T.K.

A84-44927#

ENGINEERING ASPECTS OF INTERNATIONAL COOPERATION IN AERONAUTICS

R. H. BETEILLE (Airbus Industrie, Blagnac, Haute-Garonne, France) IN: International Council of the Aeronautical Sciences, Congress, 14th, Toulouse, France, September 9-14, 1984, Proceedings. Volume 1. New York, American Institute of Aeronautics and Astronautics, 1984, p. 1-6.

International cooperation, and the joining of complex engineering functions for the benefit of aerospace programs, are discussed. Consideration is given to organizational approaches to compensate differences in national characteristics and language, and suggestions concerning the coordination of technology, when various government and industrial partners are involved, are presented. The assignment of responsibility within such a consortium is stressed, and a suggestion is made on how it might work. Companies such as Airbus and Ariane have shown favorable results through international cooperation despite increased complexity. The pursuit of such forms of activity by the aerospace community is recommended. J.P.

N84-10350# Joint Publications Research Service, Arlington, Va. MEASURES TO STEP UP PRACTICAL USE OF SCIENTIFIC WORK DISCUSSED

V. KHODZHIMATOV In its USSR Rept.: Sci. and Technol., No. 19 (JPRS-84497) p 6-12 7 Oct. 1983 Transl. into ENGLISH from Ekon. i Zhizn (Tashkent), no. 5, May 1983 p 32-36

To achieve significant acceleration of scientific-technical progress and bring all sectors of the economy to the most advanced frontiers of science and technology was proposed as one of the paramount tasks of our time. Much was done by scientists of Uzbekistan for the development of the multisectoral economy of the republic and for the creation of progressive technology in industry, capital construction, and in agriculture, especially in cotton production. Every year scientific organizations complete and turn over for practical use more than 33 different development projects with an economic impact of more than 600 million rubles. Thanks to their introduction, technical equipmentation has grown, technological processes were improved, the volume of production has increased, and the quality of output has improved. Author

N84-10351# Joint Publications Research Service, Arlington, Va. EFFECTS OF SCIENCE, TECHNOLOGY ON STRUCTURE OF PRODUCTION PROCESS

Y. A. SKOBLIKOV In its USSR Rept.: Sci. and Technol., No. 19 (JPRS-84497) p 13-31 7 Oct. 1983 refs Transl. into ENGLISH from Izv. Akad. Nauk SSSR: Ser. Ekon. (Moscow), no. 3, 1983 p 40-52

Avail: NTIS HC A06

The structure of the production process, patterns in its organization and the classification of production processes are considered. On the basis of an analysis of the dialectical interconnection among stages of the production process - preparation and direct production - and the singling out of the type of production systems and the stages of their development, the organizational content of the scientific and technical revolution is determined. Practical recommendations are given for improving the organizational structure of industry. Author

N84-10353# Joint Publications Research Service, Arlington, Va. USE OF SCIENTIFIC POTENTIAL IN INDUSTRY DISCUSSES

K. SHAKIROV In its USSR Rept.: Sci. and Technol., No. 19 (JPRS-84497) p 38-40 7 Oct. 1983 Transl. into ENGLISH from Ekon. i Zhizn (Tashkent), no. 2, Feb. 1983 p 32-33

Avail: NTIS HC A06

The practical application of results of basic research, which are considered to be concentrated in scientific establishments of the Academy of Sciences, general technical establishments, and sectorial higher educational institutions in the republic are discussed. Today they are deservedly viewed as a component part and, moreover, as the leading part of the scientific potential of physical production sectors. These scientific systems have begun to work closely on current national economic and sectorial problems as a result of consistent implementation of the party's course toward an integral combination of science, technology and production. The Experiment Plant Biology Institute and the Physical Technical Institute of the Uzbek SSR AN (Academy of Sciences), the Tashkent Polytechnical Institute and the Tashkent Agricultural Irrigation and Mechanization Institute are working productively in this direction, but the level of use of end results of the scientists' activity still cannot be considered sufficient. Author

N84-10356# Joint Publications Research Service, Arlington, Va. SCIENTISTS DISCUSS INCREASED PRODUCTION WITH FEWER WORKERS

A. L. MERSON In its USSR Rept.: Sci. and Technol., No. 19 (JPRS-84497) p 51-55 7 Oct. 1983 Transl. into ENGLISH from Leningr. Pravda (Leningrad), 26 May 1983 p 2

Avail: NTIS HC A06

After the group from the sector of methodology planning and organization of applied research of the Social Economic Problems Institute of the USSR Academy of Sciences had completed this research. A. L. Merson, senior scientific associate of the institute and candidate of economic sciences, met with V. A. Semenov.

The initiative of scientists of the Scientific Production Association of the Central Scientific Research and Planning and Design Boiler and Turbine Institute imeni I. I. Polzunov on fulfilling five-year plan tasks with fewer workers is described. Today, however, the idea of how this important initiative works and what hinders its creative introduction in other collectives is considered. This research was conducted in a number of Leningrad's scientific organizations.

Author

N84-11053# Puerto Rico Univ., Mayaguez.

MICROCOMPUTERS: A TOOL FOR PLANNING AND SCHEDULING CONSTRUCTION PROJECTS

J. F. L. GARCIA Aug. 1982 24 p refs Presented at the 5th Pan Am. Congr. on Econ. and Cost Engr., San Juan, 1-7 Aug. 1982

(PB83-211201) Avail: NTIS HC A02/MF A01 CSCL 05A

The availability of low cost microcomputers, which are small in size and large in computing capacity, make computer based techniques for planning scheduling, and control of construction projects accessible to construction contractors. A prototype microcomputer implementation of CPM (Critical Path Method) and a full CYCLONE (Cyclic Operations Network) are presented. The CPM implementation is based on precedence networks. It supports many features of CPM programs found in large computers. CYCLONE is a method for the analysis of construction operations. It focuses on how, rather than when, to carry out a construction operation. The CPM and CYCLONE systems discussed are implemented on the TRS-80 and Commodore microcomputers.

Author (GRA)

N84-12051# Synergy, Inc., Washington, D. C.

DEVELOP A NORMATIVE OR DESCRIPTIVE MODEL OF THE INTERNATIONAL/DOMESTIC CIVIL AVIATION INDUSTRY, VOLUME 3 Final Report

L. H. DYMOND, D. L. DENEMARK, and K. E. OLSONI 30 Sep. 1982 382 p 3 Vol.

(Contract F49642-81-C-0237)

(AD-A131878) Avail: NTIS HCA17/MFA01 CSCL 01B

This appendix deals with the regulatory environment that the civilian air fleet has faced in the past and will likely face in the future. A brief history of the different regulatory agencies involved with civilian air travel is presented first, followed by a more in-depth analysis of the changing regulatory environment brought about by the Airline Deregulation Act of 1978, and its possible consequences on the structure of the civilian air fleet in the future.

GRA

N84-12052# Synergy, Inc., Washington, D. C.

DEVELOP A NORMATIVE OR DESCRIPTIVE MODEL OF THE INTERNATIONAL/DOMESTIC CIVIL AVIATION INDUSTRY, VOLUME 2 Final Report

L. H. DYMOND, D. L. DENEMARK, and K. E. OLSONI 30 Sep. 1982 89 p 3 Vol.

(Contract F49642-81-C-0237)

(AD-A131877) Avail: NTIS HCA05/MFA01 CSCL 01B

Volume 2 is composed of four major sections that provide the bulk of the analysis. The first section deals with the regulatory framework, followed by a section dealing with the association framework, and a third section that deals with the industry components and demographics. The fourth section addresses the financial performance of the industry.

GRA

N84-12053# Synergy, Inc., Washington, D. C.

DEVELOP A NORMATIVE OR DESCRIPTIVE MODEL OF THE INTERNATIONAL/DOMESTIC CIVIL AVIATION INDUSTRY, VOLUME 1: EXECUTIVE SUMMARY Final Report

L. H. DYMOND, D. L. DENEMARK, and K. E. OLSONI 30 Sep. 1982 31 p 3 Vol.

(Contract F49642-81-C-0237)

(AD-A131876) Avail: NTIS HCA03/MFA01 CSCL 01B

Volume 1 of this report provides an overview of the U.S. civil aviation industry, focusing on the immediate term and the future. Its purpose is to provide a summary for identifying the implications of the projected future aircraft fleet mix on the civil/military airlift

system in the 1990 time period. The project is a direct result of the current turbulence in the airline industry and the uncertainty of the future airlift system. The results of the study provide a foundation to support the development of an analytical modeling system of the Air Staff to project alternative future configurations of the civil air fleet given alternative scenarios of future conditions in the industry. This particular phase of the effort focuses on four areas including: the regulatory framework existing in the industry and that projected to exist in the future; the association network that has developed for the civil aviation industry and its importance to the development of future air industry structure; the components of the industry itself, including the number and types of airframes, engines, support functions within the industry such as travel agents, air freight forwarders, etc.; and the industry demographics, including operating behavior, route competition, fares, etc.

GRA

N84-13595# Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).

TECHNIQUES OF CONDITION MONITORING AND FAULT DIAGNOSIS IN INDUSTRY

L. X. NEPOMUCENO 1983 159 p refs In PORTUGUESE; ENGLISH summary Presented at the Seminar. Intern. de Manutecao, Sao Paulo, Brazil, 23-25 Aug. 1983

Avail: NTIS HC A08/MF A01

The philosophy of condition monitoring in industry, through the measurement, control and monitoring of some adequate parameters, such as temperature, pressure, oil analysis, a visual examination, measurement and analysis of vibration in terms of displacement, velocity or acceleration depending on the case is presented. Some fundamental ideas of nondestructive testing techniques that are important for an effective maintenance program, and some ideas of the most modern nonconventional processes are presented. The importance of a close contact and discussions with different departments and sections of a generic plant, with the objective of getting all materials and parts using the adequate monitoring parameters in order to keep the whole installation free from nonprogrammed interruption is shown.

S.L.

N84-14696# Cape Town Univ. (South Africa). Dept. of Civil Engineering.

INFORMATION SYSTEMS DESIGN IN CONSTRUCTION MANAGEMENT

M. C. VORSTER /In South African Inst. of Civil Engineers Symp. on Computers in Construction 11 p 1982 refs

Avail: NTIS HC A08/MF A01

Some ideas and impressions about the human aspects of information systems design are presented. It is shown that many of the lessons learned from the relationship between owner architect and contractor must be applied in the design of information systems. It is stressed that success relies heavily on the individual manager's ability to produce a design brief, recognizing the objectives of his/her organization. The key role of accurate data is emphasized.

M.G.

N84-14698# Computer Applications Bureau (Pty) Ltd. (South Africa).

COMPUTERISED PLANT CONTROL SYSTEM

R. A. BORDER /In South African Inst. of Civil Engineers Symp. on Computers in Construction 12 p 1982

Avail: NTIS HC A08/MF A01

The effectiveness of a comprehensive system for controlling plant, machinery or vehicle revenue and expenditure is discussed. The advantages of the system are: flexibility in allowing the user to determine the level of detail he needs for analyzing costs; the accumulation of historic information including quantities and values for actual and budget figures; comparative analyses of similar plant items measured in return or cost per hour; the integration of the system with other systems such as invoicing, creditors, debtors, payroll, cost ledger, financial ledgers and asset registers; and comprehensive system for simplifying the preparation of budgets.

M.G.

03 INDUSTRIAL MANAGEMENT AND MANUFACTURING

N84-14700# Brett Schachat Associates, Johannesburg (South Africa).

TENDERING ON A MICRO COMPUTER

S. F. BRETT /In South African Inst. of Civil Engineers Symp. on Computers in Construction 16 p 1982

Avail: NTIS HC A08/MF A01

The development of a decentralized microcomputer system for the rapid and accurate calculation of tender prices is described. Due to the nature of construction, with the wide variety of possible components in a building, a special generalized technique had to be developed to cater for all possibilities. Another aspect important in the design of the system was that the information on which the tender was based could be used for the on-going control of costs on the project. The system was developed while in a live contracting environment and is based firmly on quantity surveying rather than accounting principles. The system does not replace the accounting approach but rather, through future development, will link in to a computerized accounting system. At that stage the system will provide a complete analysis of actuals against allowables for each item of work as the project progresses. M.G.

N84-14701# HKC Systems (Pty) Ltd. (South Africa).

SITE COMPUTERS

P. KIPPS /In South African Inst. of Civil Engineers Symp. on Computers in Construction 8 p 1982

Avail: NTIS HC A08/MF A01

The drop in price and increase in sales of microcomputers has resulted in many of them finding their way onto construction sites. The reasons why this is now a viable proposition are discussed. The installation of a computer on a construction site is described. Some of the factors involved in the centralization/decentralization debate are discussed. Author

N84-14702# IBM S.A. Proprietary Ltd., Johannesburg (South Africa).

KEEPING YOUR FINGERS CROSSED WON'T HELP

S. GERS /In South African Inst. of Civil Engineers Symp. on Computers in Construction 7 p 1982

Avail: NTIS HC A08/MF A01

With today's fluctuating economy, skill shortages and the rising costs of labor, plant and material, construction management needs to be able to utilize the power of a computer himself without obtaining the necessary computer skills in order to obtain the necessary information to maintain control of his business and enable him to make the best decisions as and when the need arises in his day to day activities relating to: plant management; estimating and tendering; measurement and certificates; cost and valuation control; project planning and scheduling; etc. Author

N84-14703# Starke (Basil) (Pty) Ltd., Cape Town (South Africa).

COMPUTERS FOR THE SMALLER CONTRACTORS

N. MARSH /In South African Inst. of Civil Engineers Symp. on Computers in Construction 12 p 1982

Avail: NTIS HC A08/MF A01

Suggestions are presented to assist the small to medium civil engineering contractor in assessing the possibility of introducing computerized systems into the organization. A general study is made of the need and advantages of such a course of action. Some of the systems that can effectively be computerized with a distinct benefit to the user are identified. The numerous alternative methods of computerization are also discussed with a view enabling the user investigate which of these options will best suit his individual needs. Finally, a working example of computerization in a medium sized company is described together with some of the difficulties encountered in the implementation of the system. M.G.

N84-14704# South African Inst. of Civil Engineers, Pretoria.

COMPUTER SIMULATION OF CONSTRUCTION OPERATIONS

G. A. VICTOR (Construction Information Systems) /In its Symp. on Computers in Construction 14 p 1982

Avail: NTIS HC A08/MF A01

A computer based system which simulates operations such as earthmoving, tilt up construction, concrete placing, and high rise building erection is described. Simulation provides a powerful tool to enable a manager to better analyze and improve operations. Eventually, the technologies and methods described will provide the basis for real time monitoring of field operations, and partial automation of some processes. Author

N84-14706# Pro-Crit (Pty) Ltd., Randburg (South Africa).

CONSTRUCTION PLANNING AND CONTROL: CURRENT PRACTICE AND CONTINUING CHALLENGES

L. S. STAPELBERG /In South African Inst. of Civil Engineers Symp. on Computers in Construction 16 p 1982

Avail: NTIS HC A08/MF A01

Computer systems in the field of construction planning and control have largely failed to effect the quality of managerial performance in the construction industry. The problem of 'optimization' versus 'implication analysis' is discussed as a reflection on a possible solution. Critical issues in the design criteria for construction planning systems are discussed with reference to the environment which stimulates their importance. M.G.

N84-14984# Oak Ridge Gaseous Diffusion Plant, Tenn.

MANAGEMENT INFORMATION SYSTEM FOR ENGINEERING

R. O. GREEN, J. M. MORRISON, and R. H. WANTLAND 30 Aug. 1983 13 p Presented at the Am. Soc. for Eng. Management Ann. Meeting, Washington, D.C., 17 Oct. 1983 (Contract W-7405-ENG-26)

(DE84-001655; K/D-544; CONF-8310131-2) Avail: NTIS HC A02/MF A01

The engineering management information system (EMIS) is a computer based information system that integrates business management systems. System scope includes engineering work load, forecasting, cost, schedule, and selected administrative information. The EMIS was developed to provide a single source of current, official data. It is structured to meet a wide variety of needs, such as facilitating both uniform support of project management requirements associated with the uniquely different missions of the plants and control of the day to day operations of the engineering organization. DOE

N84-18448# National Productivity Inst., Pretoria (South Africa).

PRODUCTIVITY AND THE FORGING INDUSTRY

A. STOCKING /In South African Inst. for Production Engineering Fourth Seminar on Efficient Metal Forming and Machining 30 p 1982

Avail: NTIS HC A11/MF A01

The ways in which the machinery, manpower, material, and money may be applied in more productive and profitable ways within the forging industry of South Africa are discussed from a practical viewpoint. The basic aspects of forging plant selection are discussed in an attempt to help management within the industry make the best choice of forging machine and correctly choose its capacity for the market sector for which it is aimed. Some information is given on furnaces and ancillary forging equipment as well as on estimates of the cost of heating in the forge. Author

N84-18449# AECI Ltd., North Rand (South Africa). Maintenance and Industrial Engineering.

PRODUCTIVITY IMPROVEMENT IN A JOBBING SHOP

P. J. J. DUPREEZ /In South African Inst. for Production Engineering Fourth Seminar on Efficient Metal Forming and Machining 7 p 1982

Avail: NTIS HC A11/MF A01

Workshop planning, manufacturing drawings, work measurement, job costing, and quality control and assurance influence productivity in a production but are much more important

in a jobbing shop. Where and how these parameters influence jobbing shop more severely than a production shop are examined. A.R.H.

N84-19605# Committee on Commerce, Science, and Transportation (U. S. Senate).

ROLE OF TECHNOLOGY IN PROMOTING INDUSTRIAL COMPETITIVENESS

Washington GPO 1984 224 p Hearings on S. 1286 before the Subcomm. on Sci., Technol. and Space of the Comm. on Com., Sci. and Transportation, 98th Congr., 1st Sess., 23 Nov., 6-7 Dec. 1983

(S-REPT-98-565; GPO-29-832) Avail: Subcommittee on Science, Technology and Space

The role of advanced manufacturing technology in competing in markets at home and abroad is examined. N.W.

N84-21765# New England Apparel Manufacturers' Association, Inc., Fall River, Mass.

MANUAL FOR IMPLEMENTING A SHARED TIME ENGINEERING PROGRAM (STEP) SEPTEMBER 1980 THROUGH SEPTEMBER 1983

H. I. ARONOFF, J. J. LESLIE, A. N. MITTLEMAN, and S. HOLT (Public Administration Inst., N.Y.) Nov. 1983 143 p Sponsored in part by US Dept. of Commerce, Washington, D.C.

(PB84-144260) Avail: NTIS HC A07/MF A01 CSCL 13H

This manual describes a Shared Time Engineering Program (STEP) conducted by the New England Apparel Manufacturers Association (NEAMA) headquartered in Fall River Massachusetts, and funded by the Office of Trade Adjustment Assistance of the U.S. Department of Commerce. It is addressed to industry association executives, industrial engineers and others interested in examining an innovative model of industrial engineering assistance to small plants which might be adapted to their particular needs. GRA

N84-23300# Cockerham (John M.) and Associates, Inc., Hopewell, Va.

COST RISK TRADE-OFFS IN TIMING THE PRODUCTION DECISION Final Report

J. M. COCKERHAM /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 33-38 1983

(AD-P002753) Avail: NTIS HC A24/MF A01 CSCL 15E

The question before every development and acquisition program, is when should production resources be committed? The actual decision to enter production is normally assumed to be the same point in time where the expenditure of production monies is authorized or initiated. This assumption is challenged through the analysis of the total cost risk of the combined RDT&E and production programs versus time. Consideration is given to technical risk, program termination liabilities, RDT&E spending rates, production spend rates, cost of program stretchout, production lead times and return on investment. The purpose is to present and explore the primary financial factors and interrelationships to determine the optimum time to expand production monies independent of the final production decision. The methods and principals are demonstrated by an example derived from an actual application on a major weapon system.

Author (GRA)

N84-23318# Office of the Under Secretary of Defense for Research and Engineering, Washington, D. C.

THE INDUSTRIAL MODERNIZATION INCENTIVES PROGRAM: AN EXPERIMENTAL EFFORT TO IMPROVE DEFENSE CONTRACTOR PRODUCTIVITY Final Report

A. D. REEVES /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 135-142 1983

(AD-P002771) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper concentrates on the philosophy and concepts behind the current test of Industrial Modernization Incentives Program (IMIP). The paper discusses how the test has been structured

and applications to date. The test program is still in the early stages and the paper stresses that there are currently many more questions than answers. The aspects requiring further analysis are explored in detail. The paper also ties together other areas that relate to the IMIP and encompass the total environment motivating contractor productivity improvement efforts. These include Weighted Guidelines, Cost Accounting Standards, employee productivity incentive and bonus systems, multiyear procurement, economic production rates, the source selection process, and manufacturing technology. Author (GRA)

N84-23319# Iowa State Univ. of Science and Technology, Ames. Center for Industrial Research and Service.

THE GOVERNMENT RELATIONSHIP TO INDUSTRY IN TECHNOLOGY TRANSFER AND DEVELOPMENT Final Report

D. H. SWANSON /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 143-148 1983

(AD-P002772) Avail: NTIS HC A24/MF A01 CSCL 05A

Iowa State University's Center for Industrial Research and Service conducted a survey of manufacturers in January 1982. This mail survey to the 3,764 manufacturers in Iowa was designed to reveal the problem areas and information needs manufacturers and processors. The survey also addressed information sources, technology development, productivity improvement, and how managers expected to improve operations. The role of government, government laboratories, universities, equipment manufacturers, and trade associations in technology transfer and development was delineated in the analysis. GRA

N84-23347# Pratt and Whitney Aircraft Group, East Hartford, Conn.

IMPACT OF CORPORATE RESOURCE ALLOCATION DECISIONS ON NATIONAL SECURITY OBJECTIVES: DISSYNERGISM IN AEROSPACE INDUSTRIAL RESOURCE PLANNING Final Report

O. M. COLLINS /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 302-315 1983

(AD-P002801) Avail: NTIS HC A24/MF A01 CSCL 15E

The purpose of the proposed paper is to assess the impact of corporate resource allocation decisions in the US aerospace industry on long-term national security objectives. The data presented demonstrates the dissynergy that exists in one critical area of national interest as the result of inconsistencies between corporate and defense strategic resource planning objectives. The DoD Industrial Base and Preparedness Program will be evaluated as a basis for creating a credible defense industrial resource planning system to parallel existing force and technology planning systems; and, integrating corporate and defense long-range planning objectives. Based on the analysis, a recommended policy and organizational approach is presented in terms of the following parameters: acquisition efficiency and industrial preparedness. GRA

N84-23348# Air Force Armament Lab., Eglin AFB, Fla.

TWO-STEP INDUSTRIAL PREPAREDNESS PLANNING: BALANCING FUNDS AND PRODUCTION CAPABILITY Final Report

K. B. JOHNSON /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 316-319 1983

(AD-P002802) Avail: NTIS HC A24/MF A01 CSCL 13H

The industrial Preparedness Planning program provides data relative to the capability of the production base to accelerate and expand production during a national emergency. Planning data also includes identification of Industrial Preparedness Measures (IPMs) which can be funded during peacetime to compress production build-up time. However, determining what IPMs to fund can be difficult since: Build-up times for components of end-item weapons vary by substantial margins; and Available funding is usually inadequate. This difficulty could be minimized by adjusting IPM data for pacing components to correspond to a common

03 INDUSTRIAL MANAGEMENT AND MANUFACTURING

build-up time based on an affordable funding level. Formalizing the adjustment of IPM data in this manner as a second step in the Industrial Preparedness Planning process would facilitate effective prioritizing of peacetime funding for IPMs. This would insure funding of only those IPMs for potential production bottlenecks to support a balanced production response capability.

GRA

N84-23383# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

THE SCORE TECHNIQUE: AN ANALYTICAL APPROACH FOR ASSESSING THE RESULTS OF MANUFACTURING REVIEWS Final Report

R. S. LIEBER and M. C. EDELBLUTE /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 537-546 1983

(AD-P002838) Avail: NTIS HC A24/MF A01 CSCL 15E

Since the early 1970's, the techniques for conducting manufacturing assessments have improved as the lessons-learned from each new team were passed on the next. However, one area of the manufacturing assessment process, the scoring, has remained relatively unchanged over the years. This paper presents a fresh approach to the scoring process. The process outlined in this paper was first developed and used on the Next Generation Trainer Program. Since then, it has been applied successfully to other Aeronautical Systems Division manufacturing reviews both in Europe and the United States. The methods discussed here can be applied to other scoring scenarios such as source selection, Cost/Schedule Criteria System (C/SCS) reviews, and related review. The technique is generally applicable to any problem whose solution can be improved by adding objectivity and traceability to an otherwise subjective scoring process.

GRA

N84-25529# Committee on Science and Technology (U. S. House).

FUTURE OF AERONAUTICS

Washington GPO 1984 144 p Hearings before the Subcomm. on Transportation, Aviation and Mater. of the Comm. on Sci. and Technol., 98th Congr., 1st Sess., no. 52, 5 Dec. 1983 (GPO-29-744) Avail: Subcommittee on Transportation, Aviation and Materials

Topics relevant to the long term research and development goals for aeronautics are discussed. Subjects include general information on certain NASA and DOD projects, civil aviation, vertical takeoff aircraft, aircraft control systems, aircraft construction materials, and aerodynamic configurations through computer aided design. Current developments in civil aviation as well as future research plans are outlined by representatives of the aviation industry.

M.A.C.

N84-25863 Technische Univ., Munich (West Germany). Inst. fuer Statistik und Unternehmensforschung.

ON A SERIES OF PROBLEMS WITH MACHINES: COSTS OF MODERNIZATION AND STORAGE IN CASE OF DEMAND [UEBER EIN EIN-MASCHINEN-REIHENFOLGEPROBLEM MIT UMRUEST - UND LAGERHALTUNGSKOSTEN BEI VORGESCHRIEBENEM BEDARF]

U. GSCHREL Jul. 1983 121 p refs In GERMAN

(TUM-M8312) Avail: Issuing Activity

Production planning which is concerned with the determination of optimal operation projects of multiple materials on one or multiple machines is discussed. Lot sizes and production sequence are determined to keep expenses to a minimal. Random lot sizes are allowed. An optimal production order of a single article was investigated. This problem is considered to be a sequence problem.

Transl. by E.A.K.

N84-26650# Air Force Systems Command, Bolling AFB, Washington, D.C.

GUIDE TO CANADIAN AEROSPACE RELATED INDUSTRIES

R. L. MCKENNEY, JR. and D. J. PEARSON Mar. 1984 124 p (AD-A140606; AFSC-TR-84-001) Avail: NTIS HC A06/MF A01 CSCL 13H

This guide is a contracting source list of Canadian aerospace related industries to be used by USAF procurement offices, project engineers, and scientists. It provides company profiles, a company keyword index, and contact points for each company.

Author (GRA)

N84-28776*# Boeing Commercial Airplane Co., Seattle, Wash. **DEVELOPMENT OF INTEGRATED PROGRAMS FOR AEROSPACE-VEHICLE DESIGN (IPAD). IPAD USER REQUIREMENTS: IMPLEMENTATION (FIRST-LEVEL IPAD)**

12 Mar. 1980 100 p refs

(Contract NAS1-14700)

(NASA-CR-162713; NAS 1.26:162713; D6-IPAD-70016-D-1)

Avail: NTIS HC A05/MF A01 CSCL 01C

The requirements implementation strategy for first level development of the Integrated Programs for Aerospace Vehicle Design (IPAD) computing system is presented. The capabilities of first level IPAD are sufficient to demonstrated management of engineering data on two computers (CDC CYBER 170/720 and DEC VAX 11/780 computers) using the IPAD system in a distributed network environment.

M.A.C.

N84-31971# Army Construction Engineering Research Lab., Champaign, Ill.

AUTOMATED CONSTRUCTION MANAGEMENT SYSTEM (ACMS). VOLUME 1: USER'S GUIDE

J. S. YOUNG and C. E. HERRING, JR. Jun. 1984 103 p 2 Vol.

(Contract DA PROJ. 4A7-62731-AT-41)

(AD-A143031; CERL-TR-P-158-VOL-1) Avail: NTIS HC A06/MF A01 CSCL 09B

The Automated Construction Management System has been developed to manage the construction projects of Army Engineer units. It is a full-feature project management system implemented on a multiuser microcomputer. The approach taken to develop the system was to exploit commercially available software programs and hardware to minimize programming requirements and allow researchers to devote their resources to application of the system. This user's manual explains how to use the General Applications Module, the Data Base Management Module, the Network Analysis Module, the Weekly Progress Report Module, and the Reports Generation Module.

GRA

N84-31972# Army Construction Engineering Research Lab., Champaign, Ill.

AUTOMATED CONSTRUCTION MANAGEMENT SYSTEM (ACMS). VOLUME 2: PROGRAM DOCUMENTATION Final Report

C. E. HERRING, JR. and J. S. YOUNG Jun. 1984 255 p 2 Vol.

(Contract DA PROJ. 4A7-62731-AT-41)

(AD-A143032; CERL-TR-P-158-VOL-2) Avail: NTIS HC A12/MF A01 CSCL 09B

The Automated Construction Management System (ACMS) has been developed to manage Army Engineer unit construction projects. It is a full-feature project management system implemented on a multiuser microcomputer system. The approach in developing the system was to exploit commercial software programs and hardware to minimize programming requirements and thus allow researchers to spend more time finding uses for the system. This volume contains the data base documentation for ACMS version 84.0, including system requirements, installation instructions, and program listings.

GRA

N84-32830# Science Applications, Inc., McLean, Va. Robotics and Automation Div.

PARTS ON DEMAND: EVALUATION OF APPROACHES TO ACHIEVE FLEXIBLE MANUFACTURING SYSTEMS FOR NAVY PARTS ON DEMAND, VOLUME 1

Feb. 1984 94 p

(Contract N00014-82-C-0845)

(AD-A143248) Avail: NTIS HC A05/MF A01 CSCL 05A

The scope of this study, sponsored by the Office of Naval Research and the Naval Supply Systems Command, focused on reducing spare part supply and procurement problems by using a Parts-on-Demand (POD) system that was defined by the study in these terms: a concept using advanced manufacturing technology to produce parts as needed and to reduce cost and production lead time in small batch production. The solution approach is based on using advanced manufacturing technologies capable of reducing cost and production lead time for low volume manufacturing. A major national program, using the concept of POD, is recommended to advance design, fabrication, test, and assembly technology for low volume production. The Navy POD program objectives were developed to foster a transition to very flexible manufacturing by encouraging both changes in vendor's manufacturing technology to support low volume production and in military supply system policy and practices to more effectively employ its benefits. The emphasis of this study was on the technological issues involved and the role the Navy can play in stimulating research and development needed to advance manufacturing technology to support flexible manufacturing system to produce low volume replenishment parts. POD, however, is not to be imagined as a stand-alone system and will certainly not work in isolation. It must be gradually integrated into the current supply and procurement system, and modifications in policy and practice will be required for its effective implementation. GRA

04

ROBOTICS AND EXPERT SYSTEMS

Includes Artificial Intelligence, Robots and Robotics, Automatic Control and Cybernetics, Expert Systems, Automation Applications, Computer-Aided Design (CAD), Computer-Aided Manufacturing.

A84-10022#**NAVY AI PROGRAMS - WITH EMPHASIS ON APPLICATIONS**

J. E. FRANKLIN (U.S. Navy, Naval Research Laboratory, Washington, DC) IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers . New York, American Institute of Aeronautics and Astronautics, 1983, p. 154-156.

(AIAA PAPER 83-2349)

US Navy programs applying AI concepts in robotics, knowledge acquisition, automated reasoning, man-machine interfaces, expert systems, natural-language input, and crisis alerting are reviewed. The individual program titles are listed, and the organizational structure is indicated. The current status and goals of the research efforts in natural languages, electronic maintenance and troubleshooting, combat management, operational planning, and multisensor information integration are discussed. T.K.

A84-17159**REDUCING DESIGN PROTOTYPING AND PRODUCTION CYCLE TIMES AND COSTS**

R. C. GALLAGHER (Westinghouse Defense and Electronics Center, Baltimore, MD) IN: Materials and processes - Continuing innovations; Proceedings of the Twenty-eighth National SAMPE Symposium and Exhibition, Anaheim, CA, April 12-14, 1983. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1983, p. 788-801.

(Contract F19628-81-C-0101)

In 1979, a program was initiated by an American company with the objective to analyze factory operations and engineering and identify where significant gains in productivity could be achieved. A number of projects were jointly funded by this company and the Air Force as part of the Technology Modernization Program (Tech Mod). The projects discussed include MARK (Material Accountability and Robotic Kitting), SEAS (Standard Electronic Assembly System), and REACH (Robotically Enabled Assembly of Cables and Harnesses). MARK and SEAS are both concerned with the manufacture of printed wiring assemblies, while REACH provides for the cable and harness commodity a very comprehensive effort for reducing design to production test cycle times and costs. G.R.

A84-25276#**AUTOMATED SPACECRAFT HEALTH AND STATUS**

R. E. WAGNER (Ford Aerospace and Communications Corp., Sunnyvale, CA) IN: Communication Satellite Systems Conference, 10th, Orlando, FL, March 19-22, 1984, Technical Papers . New York, American Institute of Aeronautics and Astronautics, 1984, p. 202-209. refs

(AIAA PAPER 84-0685)

The application of artificial-intelligence techniques to the automation of ground-based health and status management of communications satellites is discussed, summarizing preliminary results from a study of the Defense Satellite Communications System, Phase III (DSCS-III). The aim of the study is to replace large numbers of human controllers with automated expert systems (analogous to the diagnostic systems used in medicine), thus increasing the survivability of mission data in the ground segment. The general automation capacity of DSCS-III is evaluated, demonstrating the need for ongoing ground support. The electric-power distribution system and the telemetry, tracking, and command system have been chosen for expert-system-prototype development; the current control techniques (involving human analysts) of these systems are characterized. The methods used by human experts; knowledge representation; data-driven, goal-driven, and mixed control strategies; and the representation of control knowledge are considered in general terms. T.K.

A84-28014**ADVANCES IN MANUFACTURING TECHNOLOGY**

F. TURNER (Rolls-Royce, Ltd., Derby, England) (Rolls-Royce European Symposium, Reims, France, May 27, 28, 1983) Aeronautical Journal (ISSN 0001-9240), vol. 88, Feb. 1984, p. 17-22.

The importance of robotics, laser technology, and computer-aided-manufacturing in the production of large commercial aircraft engines is assessed. Attention is paid to the organization of the manufacture process around families of components, which permits the production of 35 different components on one manufacturing line without retooling. Computer-guided lasers reduced the number of operations in the hard-surfacing of interlocking turbine blade faces from five to three, and total time from seven-and-one-half minutes to 75 seconds per component. Robotic machining of directionally solidified and single crystal turbine blades reduced cutting time from six minutes to 45 seconds, and improved lead time, performance, and productivity by 50 percent. Computers monitor product quality, and warn when quality tolerance levels are approached, reducing production cost. Inventory turnover of discs and nonrotating parts was improved by 300 percent and lead times reduced by 50

04 ROBOTICS AND EXPERT SYSTEMS

percent. The use of CAD-CAM as a common data base for engineering and manufacture sectors is recommended. I.H.

A84-30608* Boeing Computer Services, Inc., Seattle, Wash.
COMPUTER-ASSISTED ENGINEERING DATA BASE
R. P. DUBE and H. R. JOHNSON (Boeing Computer Services, Inc., Seattle, WA) American Society of Mechanical Engineers, Winter Annual Meeting, Boston, MA, Nov. 13-18, 1983. 6 p. refs (Contract NAS1-14700)
(ASME PAPER 83-WA/AERO-11)

General capabilities of data base management technology are described. Information requirements posed by the space station life cycle are discussed, and it is asserted that data base management technology supporting engineering/manufacturing in a heterogeneous hardware/data base management system environment should be applied to meeting these requirements. Today's commercial systems do not satisfy all of these requirements. The features of an R&D data base management system being developed to investigate data base management in the engineering/manufacturing environment are discussed. Features of this system represent only a partial solution to space station requirements. Areas where this system should be extended to meet full space station information management requirements are discussed. Author

A84-31346

JAPAN'S NEXT GENERATION OF ROBOTS

M. TOGAI (AT&T Bell Laboratories, Holmdel, NJ) Computer (ISSN 0018-9162), vol. 17, March 1984, p. 19-25. refs

In 1983, the Japanese Ministry of International Trade and Industry (MITI) initiated a project with the objective to develop robots capable of operating in environments which might be intolerable or unsafe for humans. Three special-purpose robots are to be designed for operations in nuclear plants and undersea research stations, taking into account tasks related to disaster relief, equipment and facility maintenance, and advanced assembly. The development of generic technologies is planned, giving attention to mobile mechanisms, manipulators, sensors, control systems, and system totalization. A preview of the considered project is presented along with an overview regarding the next generation of robots, and an outline of the various subsidiary research projects which are to be completed in the 1990s. G.R.

A84-42760

PLANNING THE USE OF ROBOTS

L. BERNIER (Bernier and Associates, Inc., Topsfield, MA), L. SHPINER (Cfc, Inc., Dayton, OH), and L. WARREN (LMS Warren, Inc., Olympia Fields, IL) IN: National Technical Conference, 15th, Cincinnati, OH, October 4-6, 1983, Proceedings. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1983, p. 419-430. refs

Careful planning is essential to the effective introduction of any new technology into an existing manufacturing environment. This includes the introduction of robotic technology. In this paper, certain management attitudes toward strategic planning are reviewed, and it is noted that the systematic development of strategic manufacturing plans traditionally has not been a priority with American industry. User views regarding robots are briefly reviewed to emphasize the need for involving users as well as management in the planning process. A ten-step procedure is then described for creating manufacturing strategic plans that are completely complementary with a company's strategic business plan. Finally, a few general rules are provided for the practical application of the proposed procedure. Author

N84-11339# Joint Publications Research Service, Arlington, Va.
REPORT ON DEVELOPMENT, INSTALLATION OF INDUSTRIAL ROBOTS

K. KRAKAT *In its* East Europe Rept.: Sci. Affairs, no. 789 (JPRS-84426) p 9-24 28 Sep. 1983 refs Transl. into ENGLISH from FS Analysen (West Germany), no. 1, Avail: NTIS HC A03 1981 p 1-23

Different attitudes towards the utilization of industrial robots efficiency in the GDR economy, rationalization solutions to overcome bottle necks and defects, industrial robots for taking over certain working processes, characteristics figures and criteria for the useful economic effect of industrial robots, long term planning objectives, the current use of industrial robots and products of robot technology and their manufacturers. N.W.

N84-11817* SRI International Corp., Menlo Park, Calif. Advanced Computer Systems Dept.

RECOMMENDATIONS FOR NASA RESEARCH AND DEVELOPMENT IN ARTIFICIAL INTELLIGENCE Final Report

D. R. BROWN and P. C. CHEESEMAN Apr. 1983 97 p refs (Contract NAS5-27338; SRI PROJ. 4716) (NASA-CR-170585; NAS 1.26:170585) Avail: NTIS HC A05/MF A01 CSCL 09B

Basic artificial intelligence (AI) research, AI applications, engineering, institutional management, and previously impractical missions enabled by AI are discussed. Author

N84-11821# Illinois Univ., Urbana. Lab. for Coordinated Science.

ARTIFICIAL INTELLIGENCE IMPLICATIONS FOR INFORMATION RETRIEVAL

G. DEJONG Apr. 1983 17 p refs Presented at the 6th Ann. Intern. ACM SIGIR Conf., Washington, 6-8 Jun. 1983 (Contract F49620-82-K-0009; AF PROJ. 2304) (AD-A131382; AFOSR-83-0658TR) Avail: NTIS HC A02/MF A01 CSCL 06D

The field of information retrieval is already more aware than many other fields of the relevance of artificial intelligence. Nonetheless there remain exciting applications of artificial intelligence that have been so far overlooked. In this paper we will point out some of the ways artificial intelligence might influence the field of information retrieval. We will then examine one application in more detail to discover the kind of technical problems involved in its fruitful exploitation. GRA

N84-13867# Naval Postgraduate School, Monterey, Calif.

ARTIFICIAL INTELLIGENCE TECHNIQUES FOR INDUSTRIAL APPLICATIONS IN JOB SHOP SCHEDULING M.S. Thesis

W. B. TOWNSEND Jun. 1983 48 p (AD-A132164; AD-E850405) Avail: NTIS HCA03/MFA01 CSCL 09B

The application of AI (artificial intelligence) techniques to the scheduling of industrial production operations offers a promising new approach to a scheduling problem of great magnitude and complexity. Foremost among these techniques is a powerful knowledge representation language that is capable of modeling the production environment at all levels of detail. The capturing of such complexity in the data base enables the computer to generate feasible schedules from a very large solution space which are highly rated by human experts. An introduction to artificial intelligence is presented that discusses knowledge representation techniques and describes an intelligent scheduling system. The relevance of AI techniques to military industrial production operations is explored by examining the closed job shop in the context of jet engine repair. GRA

N84-13868# California Univ., Livermore. Lawrence Livermore Lab. Mechanical Engineering Dept.
INTRODUCTION TO FLEXIBLE MANUFACTURING SYSTEMS: THEIR APPLICATIONS, CLASSIFICATION, AND OPPORTUNITIES

G. P. SUTTON 20 Sep. 1983 31 p Presented at the Flexible Manuf. Systems-West Seminar, Anaheim, Calif., 20 Sep. 1983 (Contract W-7405-ENG-48)
 (DE83-017373; UCRL-89746; CONF-8309159-1) Avail: NTIS HC A03/MF A01

A Flexible Manufacturing System (FMS) is an automatic manufacturing system consisting of several types of automated fabrication equipment and a common material handling system, supervised by a common computer and designed to randomly manufacture or assemble products belonging to a common part family. The FMSS are essentially limited in their applications to discrete assembly of components, or the manufacture and inspection of hard goods. The FMS grouping can be classified in various ways into modules, cells or work cells, and more complex systems. Two kinds of opportunities are discussed: the opportunity to design and acquire an FMS so it gives the maximum benefits to the user, and the opportunities for the FMS builders to take advantage of a growing market. DOE

N84-15805# Carnegie-Mellon Univ., Pittsburgh, Pa. Robotics Inst.

THE HUMAN SIDE OF ROBOTICS: RESULTS FROM A PROTOTYPE STUDY ON HOW WORKERS REACT TO A ROBOT Interim Report

L. ARGOTE, P. S. GOODMAN, and D. SCHKADE May 1983 28 p
 (AD-A133438; AD-E750844; CMU-RI-TR-83-11) Avail: NTIS HCA03/MFA01 CSCL 06D

This study examines workers' reactions to the introduction of robots in a factory. The study focuses on understanding workers' psychological reactions to this new technology and to the manner in which it was introduced. Workers reported that both advantages (lower fatigue) and disadvantages (increased downtime) were associated with the introduction of the robot. Over time, workers' beliefs about robots became more complex and pessimistic. Production operators' jobs, as well as their interaction patterns with other production and support workers changed with the introduction of the robot. Consequences of these changes for increases in job stress are examined. A set of strategies for introducing robots in the factory is discussed. Author (GRA)

N84-16829# Softech, Inc., Waltham, Mass.
INTEGRATED COMPUTER-AIDED MANUFACTURING (ICAM) ARCHITECTURE PART 3. VOLUME 1: ARCHITECTURE PART 3: ACCOMPLISHMENTS Final Report, Sep. 1980 - Oct. 1982

B. R. DAVIS, S. SMITH, M. DAVIES, and B. ST. JOHN Wright-Patterson AFB, Ohio AFWAL Sep. 1983 59 p
 (Contract F33615-80-C-5109)
 (AD-A134249; REPT-1080-3-VOL-1-PT-3; AFWAL-TR-82-4063-VOL-1-3) Avail: NTIS HC A04/MF A01 CSCL 09B

The Integrated Computer Aided Manufacturing (CAM) Architecture part III was initiated to maintain and update the existing manufacturing architecture as well as develop training courses to assist in the transition of IDEF applications, concepts and procedures to other Air Force programs. This volume presents an overview of the accomplishments of Project Priority 1104, ICAM Architecture Part III. Author (GRA)

N84-18924# Army Industrial Base Engineering Activity, Rock Island, Ill. Manufacturing Technology Div.

MANUFACTURING METHODS AND TECHNOLOGY, CAM (COMPUTER AIDED MANUFACTURING) RELATED PROJECTS, FY 83-85 Final Report

T. N. LOCKE Oct. 1983 55 p
 (AD-A136572) Avail: NTIS HC A04/MF A01 CSCL 13H

This report provides a summary of the Army's FY 83-85 Manufacturing Methods and Technology Program directed toward

computer-aided manufacturing. The following information is provided for 66 projects. Project number, title, projected funding, a statement of the problem and proposed solution, and the technology thrust area into which the project is categorized.

Author (GRA)

N84-19827# Institute for Defense Analyses, Alexandria, Va. Science and Technology Div.

ARTIFICIAL INTELLIGENCE APPLICATIONS TO MAINTENANCE TECHNOLOGY WORKING GROUP REPORT IDA/OSD R AND M (INSTITUTE FOR DEFENSE ANALYSES/OFFICE OF THE SECRETARY OF DEFENSE RELIABILITY AND MAINTAINABILITY) STUDY Final Report, Jul. 1982 - Aug. 1983

A. COPPOLA (USAF) Aug. 1983 78 p
 (Contract MDA903-79-C-0018)
 (AD-A137329; AD-E500603; IDA-D-28; IDA/HQ-83-25944) Avail: NTIS HC A05/MF A01 CSCL 06D

This document records the activities and presents the findings of the Artificial Intelligence Applications to Maintenance Technology Working Group, part of the IDA/OSD Reliability and Maintainability Study, conducted during the period from July 1982 through August 1983. GRA

N84-20730# Brigham Young Univ., Provo, Utah. Computer Aided Manufacturing Lab.

MANUFACTURING INFORMATION SYSTEM Interim Report, 1 Jul. - 31 Oct. 1983

D. K. ALLEN, P. R. SMITH, and M. J. SMART 22 Dec. 1983 117 p
 (Contract AF-AFOSR-0253-82; AF PROJ. 2305)
 (AD-A137891; AFOSR-84-0031TR; IR-2) Avail: NTIS HC A06/MF A01 CSCL 13H

The size and cost of manufacturing equipment has made it extremely difficult to perform realistic modeling and simulation of the manufacturing process in university research laboratories. Likewise the size and cost factors, coupled with many uncontrolled variables of the production situation has even made it difficult to perform adequate manufacturing research in the industrial setting. Only the largest companies can afford manufacturing research laboratories; research results are often held proprietary and seldom find their way into the university classroom to aid in education and training of new manufacturing engineers. It is the purpose for this research to continue the development of miniature prototype equipment suitable for use in an integrated CAD/CAM Laboratory. The equipment being developed is capable of actually performing production operations (e.g. drilling, milling, turning, punching, etc.) on metallic and non-metallic workpieces. The integrated CAD/CAM Mini-Lab is integrating high resolution, computer graphics, parametric design, parametric N/C parts programmings, CNC machine control, automated storage and retrieval, with robotics materials handling. The availability of miniature CAD/CAM laboratory equipment will provide the basis for intensive laboratory research on manufacturing information systems. GRA

N84-20867# Institute for Defense Analyses, Alexandria, Va. Science and Technology Div.

CAD/CAM TECHNOLOGY WORKING GROUP REPORT IDA/OSD R/M (INSTITUTE FOR DEFENSE ANALYSES/OFFICE OF THE SECRETARY OF DEFENSE RESEARCH AND MAINTAINABILITY) STUDY Final Report, Jul. 1982 - Aug. 1983

J. D. OSBORN Aug. 1983 225 p
 (Contract MDA903-79-C-0018)
 (AD-A137761; AD-E500616; IDA-D-30; IDA/HQ-83-25964) Avail: NTIS HC A10/MF A01 CSCL 15C

The effective application of existing computer aided technologies and communications among subsets of computer aided technologies are issues addressed in an effort to apply computer techniques to quantum improvement in reliability, maintainability and productivity of weapons. A.R.H.

04 ROBOTICS AND EXPERT SYSTEMS

N84-22270# Naval Postgraduate School, Monterey, Calif.
METHODOLOGY FOR BENEFIT ANALYSIS OF CAD/CAM (COMPUTER-AIDED DESIGN/COMPUTER-AIDED MANUFACTURING) IN USN SHIPYARDS M.S. Thesis

R. B. GRAHLMAN Mar. 1984 87 p
(AD-A138398) Avail: NTIS HC A05/MF A01 CSCL 09B

This thesis expands the concept of Computer-Aided Design/Computer-Aided Manufacturing (CAD/CAM) in naval shipbuilding to include maintenance. This inclusion is coupled with the integration of the design and manufacturing processes in the acronym CIDMM, which stands for Computer-Integrated Design, Manufacture and Maintenance. A methodology is proposed to identify and measure the tangible and intangible benefits derived from CAD/CAM in naval shipbuilding. The methodology is flexible enough to be applied to future CIDMM systems. A decision-aid for assessing the intangible benefits and a structure for computing the time benefits are proposed in the methodology.

Author (GRA)

N84-22317*# Carnegie-Mellon Univ., Pittsburgh, Pa.
THE ROLE OF DBMS IN DESIGN RESEARCH
S. J. FENVES *In* NASA. Langley Research Center IPAD 2: p 237-254 Apr. 1984 refs
(Contract NSF MCS-78-22328)
Avail: NTIS HC A12/MF A01 CSCL 09B

Research in integrated design systems which is almost invariably predicated on the existence of a data base that acts as a common repository of data representing the emerging specification of the system or artifact designed is discussed. The role of data base management systems (DBMS) in design research is outlined as follows: (1) the representation and processing of detailed constraints is presented, including a dynamic mechanism for activating constraints as a design is firmed up, (2) a concept of treating multiple sets of constraints as data residing in the data base is presented; (3) exploratory work on the interaction of DBMS with knowledge based expert design systems is given. E.A.K.

N84-22318*# Military Academy, West Point, N. Y.
IMPACT OF IPAD ON CAD/DATABASE UNIVERSITY RESEARCH

L. M. LEACH and M. J. WOZNY (Rensselaer Polytechnic Inst.)
In NASA. Langley Research Center IPAD 2: p 255-257 Apr. 1984 refs
Avail: NTIS HC A12/MF A01 CSCL 09B

IPAD-program has provided direction, focus and software products which impacted on CAD/CAM data base research and follow-on research. The relationship of IPAD to the research projects which involve the storage of geometric data in common data base facilities such as data base machines, the exchange of data between heterogeneous data bases, the development of IGES processors, the migration of large CAD/CAM data base management systems to noncompatible hosts, and the value of RIM as a research tool is described. E.A.K.

N84-23122# Office of Naval Research, London (England).
A SURVEY OF EUROPEAN ROBOTICS RESEARCH
S. HARMON 27 Jan. 1984 17 p
(AD-A138952; ONRL-R-4-84) Avail: NTIS HC A02/MF A01 CSCL 06D

This report describes the results of a 1981 survey to gather information about European robotics research that might be tailored to meet the US Navy's needs. The objectives of the study were: to identify key research organizations and scientists, and to determine the nature of the research and technology. The survey covered Belgium, France, the UK, Italy, Switzerland, and the Federal Republic of Germany. Author (GRA)

N84-23375# University of Western Carolina, Cullowhee, N.C.
THE IMPACT OF FACTORY AUTOMATION AND ROBOTICS ON THE CONTRACTING AND ACQUISITION PROCESSES Final Report

M. D. MARTIN and R. D. GUYTON *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 495-500 1983
(AD-P002830) Avail: NTIS HC A24/MF A01 CSCL 13H

A report issued by the United States (U.S.) Comptroller General in 1976 noted that virtually every item produced by the U.S. industry is procured by the Federal Government. Products and services are procured by the Department of Defense (DoD) from over 25,000 industrial firms. The basic mechanism is through the contracting and acquisition processes. The key question raised by these circumstances is how will the increasing use of automation and robotics impact the contracting and acquisition processes in the 1980s and 1990s. A study was conducted to identify and classify the changes which will result from this trend to factory automation. The items considered include: reclassification and structure of contract costs; contracting and acquisition planning; contract types and their use; cost visibility; labor and other direct costs; cost and price analysis; cost control; bidding and solicitation procedures; and, clause structure and selection. Author (GRA)

N84-23390# Joint Publications Research Service, Arlington, Va.
COMPUTER DEVELOPMENTS AT INSTITUTE OF AUTOMATION AND ELECTROMETRY DESCRIBED

B. KONOVALOV *In its* USSR Rept.: Sci. and Technol. Policy (JPRS-UST-84-004) p 45-49 23 Feb. 1984 Transl. into ENGLISH from Izv. (USSR), 17 Sep. 1983 p 2
Avail: NTIS HC A04

Developments in the use of computers in automation technology are examined. The research in computer aided design, manufacturing, and computerized test simulations is discussed. Methods of data storage and suggestions for the integration of computer systems to optimize labor management and increase production are included. M.A.C.

N84-23800# Joint Publications Research Service, Arlington, Va.
SAAB CLAIMS WORLD'S MOST MODERN ENGINE-ASSEMBLY PLANT

U. BERGMARK *In its* West Europe Rept.: Sci. and Technol. (JPRS-WST-84-001) p 2-11 4 Jan. 1984 Transl. into ENGLISH from NY Tek. (Sweden), 13 Oct. 1983 p 30-31
Avail: NTIS HC A04/MF A01

The modernization of an engine assembly plant using computer aided manufacturing techniques and robotics is described. The development of associated tools and production procedures used to assemble the Light Component Project (LCP) modular automobile are discussed. Structural design criteria used to reduce the weight and increase the fuel efficiency of the vehicle are explained. M.A.C.

N84-23913# Joint Publications Research Service, Arlington, Va.
USSR REPORT: MACHINE TOOLS AND METALWORKING EQUIPMENT

25 Apr. 1984 46 p refs Transl. into ENGLISH from various Russian articles
(JPRS-UMM-84-008) Avail: NTIS HC A04/MF A01

Progress in machine tools and metalworking equipment development is reported. Topics discussed include: industry planning and economics, automated assembly times and aggregated machining systems, and application of robotics to industry.

N84-23914# Joint Publications Research Service, Arlington, Va.
INDUSTRY URGED TO INCREASE OUTPUT OF NC MACHINE TOOL, ROBOTICS

In its USSR Rept.: Machine Tools and Metalworking Equipment (JPRS-UMM-84-008) p 6-7 25 Apr. 1984 Transl. into ENGLISH from Pravda (Moscow), 2 Feb. 1984 p 1
 Avail: NTIS HC A04/MF A01

Methods to increase the industrial production output of machine tools are outlined. Management planning and factory automation is discussed. Use of industrial robots with programmed control is suggested. E.A.K.

N84-23915# Joint Publications Research Service, Arlington, Va.
INDUSTRY OFFICIAL ON PROGRESS IN SOVIET ROBOTICS PROGRAM

M. SHKABARDNYA *In its* USSR Rept.: Machine Tools and Metalworking Equipment (JPRS-UMM-84-008) p 37-39 25 Apr. 1984 Transl. into ENGLISH from Pravda (Moscow), 7 Jan. 1984 p 2
 Avail: NTIS HC A04/MF A01

Robot building which is a new machine building subsector is examined. A program for the development and introduction of robot manipulator complexes and versatile automated production facilities is described. Automatic manipulators and robotics complexes are developed at machine building enterprises. Specific goals and development deadlines are given and second generation robots and also for "intellectual robots" which are capable of performing complex production operations with pattern recognition. Changes are introduced in the structure of production management. E.A.K.

N84-23916# Joint Publications Research Service, Arlington, Va.
USE OF ROBOTS IN ESTONIAN AUTO, MACHINE TOOL INDUSTRIES VIEWED

O. JUROGIN *In its* USSR Rept.: Machine Tools and Metalworking Equipment (JPRS-UMM-84-008) p 40-42 25 Apr. 1984 Transl. into ENGLISH from Rahva Haal (Tallinn), 6 Mar. 1984 p 3
 Avail: NTIS HC A04/MF A01

The development of industrial robots and artificial intelligence is discussed. The benefits of robots to manufacturing methods are outlined. The further development of microprocessors for the use with robots, in the machine tool, construction, metallurgy, agriculture and hydrodynamics industry is described. E.A.K.

N84-24104# Joint Publications Research Service, Arlington, Va.
ROBOTICS IMPACT ON LABOR PRODUCTIVITY EXAMINED

F. MIKHAYLOV *In its* USSR Rept.: Human Resources (JPRS-UHR-84-009) p 23-28 11 May 1984 refs Transl. into ENGLISH from Sots. (Moscow), no. 1, Jan. 1984 p 52-54
 Avail: NTIS HC A05/MF A01

With the increased speed of automatic working, the frequency in fulfilling a complex of manual procedures in servicing semiautomatic machines also increases. The increase of labor productivity of semiautomatic machine operators is linked to a substantial rise of its intensiveness owing to the great volume of work, which is performed in a forced pose and under considerable monotony of labor. The problem of operator safety is discussed as well as the service life of industrial robots. A.R.H.

N84-24110# Joint Publications Research Service, Arlington, Va.
IMPACT OF LATVIAN ROBOTICS INSTITUTE ON INDUSTRY MODERNIZATION

E. DAVYDENKO *In its* USSR Rept.: Machine Tools and Metalworking Equipment (JPRS-UMM-84-009) p 61-64 8 May 1984 Transl. into ENGLISH from Sov. Latv. (USSR), 6 Mar. 1984 p 2
 Avail: NTIS HC A05

Social organizations of ministries, departments and enterprises must play a significant role in introducing robots. In fact, it is very important not only to accelerate the introduction of automation facilities, but also to explain its necessity, teach thrift and the economic operation of expensive robots. Author

N84-25357# Naval Postgraduate School, Monterey, Calif.
A KNOWLEDGE-BASED SYSTEM FOR LP (LINEAR PROGRAMMING) MODELING

D. R. DOLK 10 Jan. 1983 27 p
 (Contract RR0-0001)
 (AD-A139991; NPS54-83-012) Avail: NTIS HC A03/MF A01
 CSCL 12A

The focus of this paper is on linear programming (LP) software in the context of model management and decision support. As a result, we will not be interested in the algorithmic properties of LP or math programming (MP) codes, but rather their applicability to more generalized modeling environments wherein models can be linked or decomposed in a manner which frees the user from having to know the internal representation which the algorithms require. In particular, we will look at the objectives and functions of a generalized model management system and how these require a knowledge-based modeling capability. We will then describe a partial implementation of a knowledge-based modeling system for LP models called the Generalized experimental Math Programming system (GXMP). GRA

N84-26451 Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany).

IMPORTANT CAD/CAM UTILIZATION AT MBB [CAD/CAM-GROSSANWENDUNG BEI MBB]

W. D. GROPP *In its* Tech. and Sci. Publ. 1983 p 335-340 1983 In GERMAN
 (MBB-Z-13-83-O) Avail: Issuing Activity

Computer aided design (CAD) and computer aided manufacturing (CAM) was used to solve special problems. It is useful in large production like construction and preparation time of materials is considerably shortened. By throughput reduction, cost reduction, quality improvement and solving new technological problems can the industry keep up with foreign competition. Transl. by E.A.K.

N84-28450# Purdue Univ., Lafayette, Ind. School of Management.

COMPUTER-AUTOMATED TECHNOLOGICAL INNOVATION IN THREE MANUFACTURING SECTORS

A. MAJCHRZAK and V. F. NIEVA *In* AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 367-370 Apr. 1984 (AD-P003309) Avail: NTIS HC A99/MF A01 CSCL 051

A recent survey of a representative sample of manufacturing firms was undertaken to provide current information on the adoption of advanced technology and methods used for adapting workers to technological change. This paper describes results of the survey in terms of four issues: extent and nature of adoption of computer-automated equipment, extent and nature of industrial activities to train workers for adapting to technological change, relationships between automation and training, and organizational and environmental factors related to automation and training. Implications of the results for policymakers and students of technological innovation are discussed. Author (GRA)

N84-30766# Softech, Inc., Waltham, Mass.
INTEGRATED COMPUTER-AIDED MANUFACTURING (ICAM) ARCHITECTURE, PART 3. VOLUME 5: COMPOSITE FUNCTION MODEL OF MANUFACTURE PRODUCT (MFG0) Final Interim Technical Report, Sep. 1980 - Oct. 1982

S. SMITH, T. RUEGSEGGGER, and W. ST. JOHN Wright-Patterson AFB, Ohio AFWAL Sep. 1983 309 p
 (Contract F33615-80-C-5109)
 (AD-A142337; REPT-1080-34; AFWAL-TR-82-4063-VOL-5) Avail: NTIS HC A14/MF A01 CSCL 09B

The Integrated Computer Aided Manufacturing (ICAM) Architecture Part 3 was initiated to maintain and update the existing manufacturing architecture as well as develop training courses to assist in the transition of IDEF applications, concepts and procedures to other Air Force programs. This volume, Volume 5, presents the composite view depicting manufacturing as it exists today in the form of an 'AS IS' Function Model of Manufacturing. Author (GRA)

04 ROBOTICS AND EXPERT SYSTEMS

N84-30774# Softech, Inc., Waltham, Mass.
INTEGRATED COMPUTER-AIDED MANUFACTURING (ICAM) ARCHITECTURE. PART 3, VOLUME 4: COMPOSITE INFORMATION MODEL OF DESIGN PRODUCT (DES 1) Final Report, Sep. 1980 - Oct. 1982

C. MARTIN and S. SMITH Wright-Patterson AFB, Ohio
AFWAL Sep. 1983 195 p
(Contract F33615-80-C-5109)
(AD-A142447; REPT-1080-33-VOL-4; AFWAL-TR-82-4063-VOL-4)
Avail: NTIS HC A09/MF A01 CSCL 09B

The Integrated Computer Aided Manufacturing (ICAM) Architecture Part 3 was initiated to maintain and update the existing manufacturing architecture as well as develop training courses to assist in the transition of IDEF applications, concepts and procedures to other Air Force programs. This volume, Volume 4, presents the composite view depicting the design process as it exists today in the form of an 'AS IS' Information Model of Design.

Author (GRA)

N84-31743# California Univ., Santa Barbara. Dept. of Geography.
APPLYING ARTIFICIAL INTELLIGENCE TO LARGE NETWORKS

T. R. SMITH, J. L. STAR, Principal Investigators, and R. DUBAYAH *In its* Activities of the Remote Sensing Inform. Sci. Res. Group 4 p 1 May 1984 ERTS
Avail: NTIS HC A07/MF A01 CSCL 09B

The use of artificial intelligence to access and process geographically dispersed data sets with the use of geographically distributed software is examined. This requires capabilities in the areas of distributed data base management, long-haul networking, information presentation, distributed problem solving and artificial intelligence. In particular, the Pilot Land Data System, the Pilot Ocean Data System, and the Pilot Climate Data Base Management System (as well as a proposed Global Resource Information System) are structured as large computer networks. The techniques of artificial intelligence are discussed as they apply in distributed problem solving.

M.A.C.

N84-31973# Softech, Inc., Waltham, Mass.
INTEGRATED COMPUTER-AIDED MANUFACTURING (ICAM) ARCHITECTURE. PART 3, VOLUME 6: COMPOSITE INFORMATION MODEL OF 'MANUFACTURE PRODUCT' (MFG1) Final Report, Sep. 1980 - Oct. 1982

C. MARTIN, A. NOWLIN, W. ST. JOHN, S. SMITH, and T. RUEGSEGGER Wright-Patterson AFB, Ohio AFWAL Sep. 1983 899 p 8 Vol.
(Contract F33615-80-C-5109)
(AD-A143072; REPT-1080-35; AFWAL-TR-82-4063-VOL-6) Avail: NTIS HC A99/MF A01 CSCL 09B

The Integrated Computer Aided Manufacturing (ICAM) Architecture Part III was initiated to maintain and update the existing manufacturing architecture as well as develop training courses to assist in the transition of IDEF (ICAM definition) applications, concepts and procedures to other Air Force programs. This volume, Volume VI, presents the composite view depicting manufacturing as it exists today in the form of an AS IS Information Model of Manufacturing.

Author (GRA)

N84-31984# National Aerospace Lab., Amsterdam (Netherlands). Informatics Div.
THE INFLUENCE OF COMPUTER AIDED DESIGN (CAD) ON RESEARCH

W. LOEVE and R. F. VANDENDAM 5 Jun. 1983 17 p refs
In DUTCH; ENGLISH summary Presented at Symp. on de Betekenis van CAD/CAM voor de Neder. vliegtuigbouw, Delft, 6 May 1983

(NLR-MP-83026-U; AD-B084828) Avail: NTIS HC A02/MF A01

The effects of CAD on cooperation aspects within the National Aerospace Laboratory (NLR) and between NLR and the aircraft industry are discussed. An infrastructure of hardware and software to support the aerodynamic design of aircraft is described. Organizational and technical aspects of this development are

described. The CAD techniques make it possible to program NLR knowledge in such a way that it can directly be used for design in the industry by means of a dialogue between computer and designer.

Author (ESA)

N84-32826# Committee on Small Business (U. S. House).
IMPACT OF ROBOTS AND COMPUTERS ON THE WORK FORCE OF THE 1980'S

Washington GPO 1984 258 p refs Hearings before the Subcomm. on Gen. Oversight of the Comm. on Small Business, 98th Congr., 1st Sess., 17-18 May 1983

(GPO-31-912) Avail: Subcommittee on General Oversight

The economic and technological impact of robotics and artificial intelligence on the work force is examined through the testimony of government, industry, and university representatives. A current assessment of the skills of the labor force, educational opportunities, and projected unemployment figures are also discussed.

M.A.C.

N84-34649# Joint Publications Research Service, Arlington, Va.
MIDI-ROBOTS GET UNDERWAY IN SEPTEMBER: LAB-INDUSTRY LINK

J. J. CHIQUET *In its* West Europe Rept.: Sci. and Technol. No. 157 (JPRS-84434) p 39-40 29 Sep. 1983 Transl. into ENGLISH from Liberation (Paris), 22 Jun. 1983 p 18
Avail: NTIS HC A04/MF A01

The CNRS (National Center for Scientific Research) has just created its first industrial link: Midi-Robot. The Midi-Robot company will operate in three areas: robot control software, particularly for assembly operations, robot vision systems, and engineering of automated production systems. The company also intends to operate in a consulting capacity on production problems for other companies. It will later become involved in artificial intelligence and control systems. In the long run, the objective is to build up an array of products able to compete on the world market.

B.W.

N84-34972# Joint Publications Research Service, Arlington, Va.
ACADEMICIAN VAMOS INTERVIEWED ON AUTOMATION RELATED PROBLEMS

J. KOZMA *In its* East Europe Rept.: Sci. and Technol. (JPRS-ESA-84-028) p 31-36 1 Aug. 1984 Transl. into ENGLISH from Nepszabadsag (Budapest), 30 Jun. 1984 p 5
Avail: NTIS HC A03/MF A01

The development of automated industrial techniques in Hungary is discussed. Social factors, international cooperation, industrial leadership, the role of the engineer, and conditions that should influence technical development are discussed.

R.J.F.

N84-34991# Softech, Inc., Waltham, Mass.
INTEGRATED COMPUTER-AIDED MANUFACTURING (ICAM) ARCHITECTURE, PART 3. VOLUME 7: MFG01 GLOSSARY Final Report, Sep. 1980 - Oct. 1982

R. HEINE, R. PREWETT, S. COLEMAN, L. BEEBE, and B. DAVIS Wright-Patterson AFB, Ohio AFWAL Sep. 1983 235 p
(Contract F33615-80-C-5109)
(AD-A144426; AFWAL-TR-82-4063-VOL-7) Avail: NTIS HC A11/MF A01 CSCL 09B

The Integrated Computer Aided Manufacturing (ICAM) Architecture Part 3 was initiated to maintain and update the existing manufacturing architecture as well as develop training courses to assist in the transition of IDEF applications, concepts and procedures to other Air Force programs. This volume presents all the terms from the function and information models of manufacturing.

Author (GRA)

N84-34999# LTV Aerospace Corp., Dallas, Tex. Vought Aero Products Div.

ICAM (INTEGRATED COMPUTER AIDED MANUFACTURING) CONCEPTUAL DESIGN FOR COMPUTER-INTEGRATED MANUFACTURING. VOLUME 4, PART 5, TASK D: QUALITY ASSURANCE/QUALITY, CONTROL/TECHNICAL REQUIREMENT/TASKS, QUALITY ASSURANCE MODELING AND ANALYSIS, ARCHITECTURE FOR PRODUCT ASSURANCE, (TTD) Final Technical Report, 1 Oct. 1981 - 29 Jun. 1984
D. L. NORWOOD, R. H. WETTACH, B. R. SHEPHERD, W. D. VINSON, and R. R. PRESTON Jun. 1984 102 p
(Contract F33615-81-C-5119)
(AD-A144691; REPT-2-20150/4R-2; TTD110513000;
AFWAL-TR-84-4020-VOL-4) Avail: NTIS HC A06/MF A01
CSCL 13H

This document, Volume 4, Part 5 of the Final Technical Report contain the QA Architecture for Product Assurance Document. This document presents the models and architecture of the QA AS-IS system. It is a technology transfer oriented report that simplifies the modernization process considerably by providing a logical process to sequence improvement events, prioritize those operations that merit immediate attention, eliminate replications of procedures, and establish a pattern or road map that is designed to be a pertinent while at the same time flexible enough to adapt to any given situation. GRA

N84-35126# National Science Foundation, Washington, D.C. Directorate of Engineering.

REPORT OF THE INFORMATION TECHNOLOGY WORKSHOP
R. F. COTELLESA 1 Oct. 1983 162 p
(AD-A144212) Avail: NTIS HC A08/MF A01 CSCL 05A

The U.S. position of leadership in information technology is being challenged as never before. The central question that capsules the purpose of the Workshop is: What areas of research are most important to sustain the vitality of this crucial sphere of national life - with consequences for the economy and national security? The effort, reported herein, addressed the following six topical areas in as much depth as possible: Artificial Intelligence; Distributed Computing and Networking; Highly Parallel Computing; Information Science; Research in Support of Some Major Use Areas; and Robotics. GRA

05

COMPUTERS AND INFORMATION MANAGEMENT

Includes Information Systems and Theory, Information Dissemination and Retrieval, Management Information Systems, Database Management Systems and Databases, Data Processing, Data Management, Communications and Communication Theory, Documentation and Information Presentation, Software, Software Acquisition, Software Engineering and Management, Computer Systems Design and Performance, Configuration Management (Computers), Networking, Office Automation, Information Security.

A84-10011*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

BUILDING AN INFORMATION MODEL (WITH THE HELP OF PSL/PSA)

E. D. CALLENDER and A. M. FARNY (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1983, p. 64-71. refs (AIAA PAPER 83-2329)

Problem Statement Language/Problem Statement Analyzer (PSL/PSA) applications, which were once a one-step process in which product system information was immediately translated into PSL statements, have in light of experience been shown to result in inconsistent representations. These shortcomings have prompted

the development of an intermediate step, designated the Product System Information Model (PSIM), which provides a basis for the mutual understanding of customer terminology and the formal, conceptual representation of that product system in a PSA data base. The PSIM is initially captured as a paper diagram, followed by formal capture in the PSL/PSA data base. O.C.

A84-10015*# National Aeronautics and Space Administration, Washington, D. C.

THE NASA SOFTWARE MANAGEMENT AND ASSURANCE PROGRAM

D. L. HALL and W. M. WILSON (NASA, Washington, DC) IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1983, p. 94-100. refs (AIAA PAPER 83-2336)

A committee of experienced managers representing each major NASA organization guides a major development effort which seeks to ensure the acquisition of economical and reliable software for more complex future programs. The primary, near-term development objectives of the NASA Software Management and Assurance Program are: (1) to provide the best management and technical guidance available; (2) to facilitate the use of proven tools, techniques, and information; and (3) to maintain a pool of highly qualified software personnel. The software development tasks addressed involve such problems as satellite end-to-end architecture and advanced aircraft guidance and control systems. O.C.

A84-10048#

DECENTRALIZED RESOURCE MANAGEMENT FOR EMBEDDED COMPUTERS

E. D. JENSEN (Carnegie-Mellon University, Pittsburgh, PA) IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1983, p. 314-316. refs (AIAA PAPER 83-2405)

The 'Archons' project seeks resource management (distributed systems) paradigms which are intrinsically decentralized. The applications environment initially addressed is that of embedded computers for supervisory real time control, such as those found in combat platform management systems. The preliminary experimental results obtained promise increased robustness and modularity, by comparison to the performance of conventional computers and their networks. The decentralized resource management principles presented are applicable to integrated man/machine systems, applications software, operating systems, and machine architecture. O.C.

A84-10062#

EVOLUTION OF A SOURCE LIBRARY SYSTEM

B. TAYLOR (Intermetrics, Inc., Cambridge, MA) IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1983, p. 432-439. refs (AIAA PAPER 83-2427)

The evolution of a source library system to fit a given programming project structure is discussed. The source library is automated and contains data on the status and history of a product, imposes some structure on the data, and provides some restraint on access to the data. Previous versions of the software modules are retained in categories designated by their temporal introduction. The library can contain the project proposal, contract, functional specifications, design documents, code, documentation, test cases, project memos, and error reports. The commands and control for the library encompass capabilities for item creation and deletion, access sharing, and modification sharing. It is noted that the modules are only permitted into the sharing mode when robustness is demonstrated. Examples are provided in terms of two compiler projects. M.S.K.

05 COMPUTERS AND INFORMATION MANAGEMENT

A84-10065*# National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, Tex.
FORECASTING TRENDS IN NASA FLIGHT SOFTWARE DEVELOPMENT TOOLS

J. R. GARMAN (NASA, Johnson Space Center, Houston, TX) IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1983, p. 463-471. refs (AIAA PAPER 83-2334)

The experience gained in the design and development of Shuttle flight and ground support embedded software systems along with projections of increasing role and size of software in the proposed Space Station and other future NASA projects provides the basis for forecasting substantial changes in the tools and methodologies by which embedded software systems are developed and acquired. Similar changes in software architectures and operator interfaces will lead to substantial changes in the approach and techniques involved in software test and system integration. Increasing commonality among different flight systems and between flight and supporting ground systems is projected, along with a more distributed approach to software acquisition in highly complex projects such as Space Station. Author

A84-15309
CONFIGURATION AND DOCUMENTATION MANAGEMENT
[GESTION DE LA CONFIGURATION ET DE LA DOCUMENTATION]

A. RAMPILLON (Matra, S.A., Toulouse, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings. Toulouse, Cepadues-Editions, 1983, p. 255-284. In French.

Configuration and documentation management assures that at every instant a complete technical description is available for a spacecraft under development, that the flow of materials and work can be controlled, that costs can be controlled, and that all interfaces are built properly. Configuration controlled products are thereby obtained, fully identified, verified, and documented, so that all technical references are complete and can be used during operation or installation of the satellite. Much of the documentation originates at the industry level and includes both system and subsystem descriptions. Interface requirements are documented and used as a guide for the manufacturers, who also document the chosen configurations and verification tests results, which are performed at more integrated levels when the product is delivered. Modifications are subject to strict reviews by committees and the Project Manager, who has the responsibility for the coordinating and assuring production and transfer of all relevant documentation. M.S.K.

A84-16633
AUTOMATING THE CONFIGURATION MANAGEMENT PROCESS

S. ZUCKER (General Electric Co., Space Systems Div., Philadelphia, PA) IN: NAECON 1983; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 17-19, 1983. Volume 2. New York, Institute of Electrical and Electronics Engineers, 1983, p. 880-885. refs

Configuration Management (CM) is a set of technical and administrative disciplines which management uses as a technique to manage complex tasks. The manual procedures which have been used in the past for performing configuration management have proven to be cumbersome and, often, unreliable. In order to make the involved procedures more efficient and reliable, an automated, interactive Configuration Management System (CMS) was developed. The CMS represents a complete computer system which will track and control emerging product items through all phases of a project. Attention is given to status accounting, control and tracking, configuration management procedures, the engineering review board, initiating control, controlled operations, and aspects of coordination and reporting. G.R.

A84-16649
AUTOMATED INTERFACE MANAGEMENT FOR MODULAR SOFTWARE DEVELOPMENT

D. KEINKE and F. W. KUETHE, III (Westinghouse Defense and Electronics System Center, Baltimore, MD) IN: NAECON 1983; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 17-19, 1983. Volume 2. New York, Institute of Electrical and Electronics Engineers, 1983, p. 994-1001.

Attention is called to the greater structure and modularity seen in today's complex software systems, noting that most structure software design philosophies have modular software design as a basic requirement. The management system described was designed to reduce the amount of unproductive labor in managing software interfaces and in producing documentation that satisfies military documentation standards. Through automation of the interface management for complex software systems, the manpower requirements are reduced. In addition, continuous design feedback is ensured, and the documentation produced is more complete and correct. C.R.

A84-24449
SOFTWARE DEVELOPMENT MANAGEMENT PLANNING

J. COOPER (CACI, Inc., Arlington, VA) IEEE Transactions on Software Engineering (ISSN 0098-5589), vol. SE-10, Jan. 1984, p. 22-26.

The lack of comprehensive planning prior to the initiation of a software development project is a very pervasive failing. This paper walks through a sample software development plan discussing the various areas that a software development manager should address in preparing his project's plan. Various considerations and suggestions are presented for each of the management subject areas. How the user/customer can use the developer's plan to aid in monitoring of his software's evolution is also presented. Detailed planning of a software development project is necessary to the successful completion of the project. Author

A84-26710
CRISIS AVOIDANCE IN A SOFTWARE MANAGEMENT SITUATION

M. EVANS (Integrated Computer Engineering, Cupertino, CA) IN: Digital Avionics Systems Conference, 5th, Seattle, WA, October 31-November 3, 1983, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1983, p. 4.1.1-4.1.7.

The general characteristics of software management and development are examined. Crises situations are found to fall into three major areas, which are related to project planning problems that inhibit the manager's effectiveness, resource availability problems, and test and integration problems. The origin of software management problems goes back to the start of the project. The software manager must, therefore, recognize the importance of early planning for the long-term health of the project. The essential first step is the software development plan. Poor productivity will result as a consequence of trading short term project requirements for long term planning requirements. Attention is given to secondary planning documentation, project drift caused by poor planning, approaches for implementing the plan, questions of resources availability, and an avoidance of potential catastrophes associated with testing by early planning. G.R.

A84-26713*# National Aeronautics and Space Administration.
Flight Research Center, Edwards, Calif.

SOFTWARE CONTROL AND SYSTEM CONFIGURATION MANAGEMENT - A PROCESS THAT WORKS

K. L. PETERSEN (NASA, Flight Research Center, Edwards, CA) and C. FLORES, JR. IN: Digital Avionics Systems Conference, 5th, Seattle, WA, October 31-November 3, 1983, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1983, p. 4.5.1-4.5.8.

A comprehensive software control and system configuration management process for flight-crucial digital control systems of advanced aircraft has been developed and refined to insure efficient flight system development and safe flight operations. Because of

the highly complex interactions among the hardware, software, and system elements of state-of-the-art digital flight control system designs, a systems-wide approach to configuration control and management has been used. Specific procedures are implemented to govern discrepancy reporting and reconciliation, software and hardware change control, systems verification and validation testing, and formal documentation requirements. An active and knowledgeable configuration control board reviews and approves all flight system configuration modifications and revalidation tests. This flexible process has proved effective during the development and flight testing of several research aircraft and remotely piloted research vehicles with digital flight control systems that ranged from relatively simple to highly complex, integrated mechanizations. Author

A84-26714

AVIONICS SOFTWARE MANAGEMENT AND CONTROL

L. M. CARRIER and G. H. KASAI (Rockwell International Corp., Los Angeles, CA) IN: Digital Avionics Systems Conference, 5th, Seattle, WA, October 31-November 3, 1983, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1983, p. 4.6.1-4.6.4.

The present investigation is concerned with a software management and control program (SMC) which is to conduct successful software projects. The approaches used in planning the management and control system are discussed, taking into account initial planning, pragmatic SMC aspects, requirements to provide positive benefits, the task to minimize the impact of control to software developers, the desirability of a supportive attitude, an exercise of the right degree of controls, the need for practical tailoring guidelines to fit the circumstances, the required flexibility of design management and the control system, and an evolutionary SMC implementation. A description of appropriate procedures for the implementation of the basic elements of SMC is also provided. G.R.

A84-31347

COMPUTER RESEARCH IN JAPAN

H. S. STONE (Massachusetts, University, Amherst, MA) Computer (ISSN 0018-9162), vol. 17, March 1984, p. 26-32. refs

The report about computer research in Japan contains information obtained during a three-week tour of Japan in July and August 1982. A cross section of research activity is provided, taking into account four types of architectures with parallel characteristics, signal transmission involving the use of an optical bus with a collection of processors, and a comparison of research environments at Japanese and American universities. Academic research and corporate education in Japan and the U.S. are compared, and the influence of the Japanese language on computer technology is examined. It is found that the characteristics of the kanji characters (ideographs) have a profound effect on pattern recognition, keyboards, CRT displays, printers, and microcomputers in Japan. Two national computer projects are also discussed. One project, known as the Fifth-Generation Computer project, proposes to develop the technology for automatic language translation, speech recognition, and automatic software production. The second project, called the supercomputer project, has the objective to create a computer capable of 10G flops. G.R.

A84-31351

GRIDNET - AN ALTERNATIVE LARGE DISTRIBUTED NETWORK

R. T. MOORE (National Bureau of Standards, Institute for Computer Sciences and Technology, Washington, DC), N. F. GEER (General Electric Co., Space Systems Div., Philadelphia, PA), and H. A. GRAF (General Electric Co., Fairfield, CT) Computer (ISSN 0018-9162), vol. 17, April 1984, p. 57-66. Research sponsored by the U.S. Defense Nuclear Agency. refs

It is pointed out that network configurations which are centrally controlled to promote the efficient transfer of information are particularly vulnerable in times of disaster. The reason for this vulnerability is related to their dependence upon the continued operation of the controller. More fault tolerant are configurations

which use either distributed control to permit gradual degradation of network performance when nodes fail or double loops to provide redundancy or limited rerouting of data when links fail. Most of the current fault-tolerant configurations, however, suffer from one of three drawbacks. They are vulnerable to becoming fragmented in a hostile environment, they are incapable of handling some of the problems which arise when link outages occur, or they are incapable of ensuring message delivery in a hostile environment. Gridnet has been developed in response to the considered unsolved network configuration and network survival problems. It is formed by interconnecting a number of dual loops in a 'Crossfire configuration'. G.R.

A84-33153*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PREFERENCES ON TECHNICAL REPORT FORMAT - RESULTS OF A SURVEY

T. E. PINELLI, V. M. CORDLE (NASA, Langley Research Center, Hampton, VA), M. GLASSMAN (Old Dominion University, Norfolk, VA), and R. F. VONDRAN (Catholic University of America, Washington, DC) Society for Technical Communication, International Technical Communication Conference, 31st, Seattle, WA, Apr. 29-May 2, 1984, Paper. 6 p. refs

A survey of 513 engineers and scientists employed at the National Aeronautics and Space Administration Langley Research Center and 600 engineers and scientists from three professional/technical societies solicited the opinions of report users concerning the format of NASA technical reports. The results indicate that a summary as well as an abstract should be included, that the definitions of symbols and glossary of terms should be located in the front of the report, and that the illustrative material should be integrated with the text rather than grouped at the end of the report. Citation of references by number, one-column, ragged-right-margin layout, and third-person writing style are also preferred by a majority of the respondents. Author

A84-41201

A TOTAL SYSTEM DESIGN FRAMEWORK

G.-C. ROMAN, M. J. STUCKI, W. E. BALL, and W. D. GILLET (Washington University, St. Louis, MO) Computer (ISSN 0018-9162), vol. 17, May 1984, p. 15-24, 26. refs (Contract F3062-80-C-0284)

The development of successful computer systems requires an intense planning effort. For such an effort, suitable integrated design methodologies are needed. The present investigation is concerned with a total system design (TSD) framework which supports the development of integrated system design methodologies. In the TSD framework, system development is partitioned into stages and phases. After the problem definition stage, the system design stage is considered along with the software design stage, the machine design stage, the circuit design stage, and the firmware design stage. The 10 steps representing the design activities involved in each TSD phase are discussed. Attention is also given to hardware/software tradeoffs, aspects of context identification, framework pruning, the selection and validation of the specification language, the selection of design/analysis techniques, the sequencing of design/analysis activities, and the addition of project management components. G.R.

A84-44325* Jet Propulsion Lab., California Inst. of Tech., Pasadena.

ALGORITHM 607 - TEXT EXCHANGE SYSTEM: A TRANSPORTABLE SYSTEM FOR MANAGEMENT AND EXCHANGE OF PROGRAMS AND OTHER TEXT

W. V. SNYDER (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) and R. J. HANSON (Sandia National Laboratories, Albuquerque, NM) ACM Transactions on Mathematical Software (ISSN 0098-3500), vol. 9, Dec. 1983, p. 427-440. NASA-supported research. refs (Contract AT(29-1)-789)

A84-45547* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

THE FUNCTION OF REPORT COMPONENTS IN THE SCREENING AND READING OF TECHNICAL REPORTS

T. E. PINELLI, V. M. CORDLE (NASA, Langley Research Center, Hampton, VA), and R. F. VONDRAN (Catholic University of America, Washington, DC) Journal of Technical Writing and Communication (ISSN 0047-2816), vol. 14, no. 2, 1984, p. 87-94. refs

A reader preference survey of engineers and scientists at the NASA Langley Research Center and in three professional/technical societies was conducted to determine the opinions of report users and producers concerning the format (organization) of NASA technical reports and the usage of technical report components. The survey questionnaire contained fourteen questions covering twelve survey topics. This article reports the findings of two survey topics: the components initially reviewed or read to determine whether to read a report in its entirety and the order in which report components are read. Author

A84-45572* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

REPORT FORMAT PREFERENCES OF TECHNICAL MANAGERS AND NONMANAGERS

T. E. PINELLI, V. M. CORDLE (NASA, Langley Research Center, Hampton, VA), M. GLASSMAN (Old Dominion University, Norfolk, VA), and R. F. VONDRAN, JR. (Catholic University of America, Washington, DC) Technical Communication (ISSN 0049-3155), vol. 31, no. 2, 2nd Quarter 1984, p. 4-8. refs

A survey of engineers and scientists concerning the format of NASA technical reports indicates that a summary as well as an abstract should be included, that the definitions of symbols and glossary of terms should be located in the front of the report, and that the illustrative material should be integrated with the text rather than grouped at the end of the report. Citation of references by number, one-column, ragged-right-margin layout, and third-person writing style are also preferred by a majority of the respondents. The preferences of managers and nonmanagers are very similar for all aspects of technical report format covered by the survey. Author

A84-49262

NU - A NETWORK MONITORING, CONTROL, AND MANAGEMENT SYSTEM

S. L. BERNSTEIN and J. G. HERMAN (Bolt Beranek and Newman, Inc., Cambridge, MA) IN: ICC '83 - Integrating communication for world progress; International Conference on Communications, Boston, MA, June 19-22, 1983, Conference Record. Volume 1. New York, Institute of Electrical and Electronics Engineers, 1983, p. 478-483.

Although ARPANET-like packet-switching networks function autonomously, for smooth operation sophisticated facilities for monitoring, control, and management are required. Such facilities can be provided by a Network Operations Center (NOC) using BBN's NU software. The NU (Network Utilities) system supplies services for failure detection, isolation, and correction, network configuration monitoring and control, traffic and performance data collection, and software maintenance and distribution in a highly integrated and flexible design. NU is a multiprocess, message-passing system, in which backbone processes (an External Message Handler, a Poller, and an Event Dispatcher) provide support services for application processes which monitor status, deduce network topology, collect performance statistics, send control instructions to network components, and display collected information. NU also includes a database of all network components, which is used extensively by NU processes for communicating with network entities and for interpreting messages about them. Author

N84-10786# California Univ., Los Angeles. School of Management.

ISSUES IN SOFTWARE MAINTENANCE

B. P. LIENTZ Jul. 1983 24 p refs
(Contract N00014-83-K-0257; NR PROJ. 049-345)
(AD-A130622) Avail: NTIS HC A02/MF A01 CSCL 05A

Up to a few years ago the area of software maintenance was largely ignored. Interest has increased in the last few years due to several factors. First, the increased volume of enhancement and maintenance with more systems from that of ten years ago has restricted resources available for new development. Second, there has been a growing awareness that tools and aids which assist development of information systems may have little effect on operational systems. Third, the management of information systems has come under increasing scrutiny. In this report we highlight some of the major issues that surfaced during several extensive operational software studies. These sources have pointed to significant questions that must be addressed concerning the roles of the users in operations and maintenance, the management of maintenance, and the types of tools and techniques that are needed in maintenance. Author (GRA)

N84-10807# Los Alamos Scientific Lab., N. Mex.

FUTURE DIRECTIONS IN LARGE-SCALE SCIENTIFIC COMPUTING

J. M. HYMAN Apr. 1983 32 p refs
(Contract W-7405-ENG-36)
(DE83-013229; LA-9637-MS) Avail: NTIS HC A03/MF A01

Techniques now used to program physics production codes cannot cope with the increasing complexity of large-scale scientific and engineering problems. Future codes must be based on sound, scientific, computing-structured design principles and include the characteristics of flexibility, modularity, reliability, have standardized documentation, and use high-level support libraries. To meet these requirements, high-level mathematical software must be developed and existing ties among the national laboratories, industry, and universities must be strengthened. DOE

N84-11066# Oak Ridge National Lab., Tenn.

PROCEEDINGS OF THE 1982 INTEGRATED DATA USERS WORKSHOP

R. J. OLSON and N. T. MILLEMAN 1982 193 p refs
Proc. held at Reston, Va., 13 Oct. 1982
(Contract W-7405-ENG-26)

(DE83-014761; CONF-8210120) Avail: NTIS HC A09/MF A01

Ways for improving the efficiency of data systems and to maintain and increase productivity are discussed. Creating long term strategies for coping with this problem is of real interest to both the producers and consumers of data and information. The pervasive and interlinked problems of society must be addressed using data that can be interrelated among physical, economic, and demographic dimensions. The status of integrated data systems in the present climate and approaches for coping with the challenge of how to do more with less are addressed. Two general areas are discussed: first, technologically based alternatives for improving efficiency and accessing information; and second, institutional alternatives involving options like the sharing of resources and public/private sector cooperation. GRA

N84-11365# Polytechnic Inst. of New York, Brooklyn.

RESEARCH IN NETWORK MANAGEMENT TECHNIQUES FOR TACTICAL DATA COMMUNICATIONS NETWORKS Final Technical Report, 1 Sep. 1980 - 31 Aug. 1982

R. BOORSTYN, A. KERSHENBAUM, B. MAGLARIS, and P. SARACHIK 1 Sep. 1982 438 p refs
(Contract DAAK80-80-K-0579)
(AD-A131357; CECOM-80-0579-F) Avail: NTIS HC A19/MF A01 CSCL 05A

This is the final technical report for work performed on network management techniques for tactical data networks. It includes all technical papers that have been published during the control period. Research areas include Packet Network modelling, adaptive

network routing, network design algorithms, network design techniques, and local area networks. Author (GRA)

N84-11772# National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
COMPUTER SCIENCE AND TECHNOLOGY: MICROCOMPUTER: A REVIEW OF FEDERAL AGENCY EXPERIENCES Final Report

D. GILBERT, E. PARKER, and L. ROSENTHAL Jun. 1983 149 p refs
(PB83-238972; NBS-SP-500-102; LC-83-600545) Avail: NTIS HC A07/MF A01 CSCL 09B

The results of a recent study which reviewed Federal agency experience with microcomputers during the period of August 1982 to January 1983 are documented. Interviews conducted with the Federal agencies are presented in detail, summarized, and tabulated. Related management and technical issues are identified and discussed. GRA

N84-11781# Naval Research Lab., Washington, D. C. Computer Science and Systems Branch.

A METHODOLOGY FOR COLLECTING VALID SOFTWARE ENGINEERING DATA Interim Report

V. R. BASILI and D. M. WEISS 12 Jul. 1983 25 p refs
(Contract RR140941)
(AD-A131332; NRL-8679) Avail: NTIS HC A02/MF A01 CSCL 05A

An effective data collection method for evaluating software development methodologies and for studying the software development process is described. The method uses goal-directed data collection to evaluate methodologies with respect to the claims made for them. Such claims are used as a basis for defining the goals of the data collection, establishing a list of questions of interest to be answered by data analysis, defining a set of data categorization schemes, and designing a data collection form. Feasibility of the data collection methodology was demonstrated by applying it to five different projects in two different environments (other NRL Reports). The application showed that the methodology was both feasible and useful. GRA

N84-12747# Naval Postgraduate School, Monterey, Calif.
COMPUTER SYSTEM DESIGN ENVIRONMENT SOFTWARE DEVELOPMENT PLAN

A. A. ROSS and J. BOWERS 29 Jul. 1983 25 p
(AD-A131651; NPS52-83-009) Avail: NTIS HCA02/MFA01 CSCL 09B

The Computer Systems Design Environment (CSDE) project is an attempt at automated design of computer systems. The project develops a system which will accept functional statements of requirements from the designer (utilizing a user friendly dialogue); translate those requirements into software and hardware primitives; evaluate those primitives and develop a proposed system using a Library of Realization Volumes. The CSDE will also verify that timing requirements have been met by the proposed hardware and software; and present the system design to the designer (in a user friendly format). The CSDE will be a prototype based on an existing feasibility demonstration version which has verified the concept. The prototype version will explore issues of adaptability, user friendliness and design system performance. This paper is a plan for the development of the CSDE. Author (GRA)

N84-13012# Young (Arthur) and Co., Washington, D. C.
OFFICE AUTOMATION MANAGEMENT GUIDE Final Report, Apr. - May 1983

May 1983 49 p
(Contract MDA903-79-C-0690)
(AD-A131770) Avail: NTIS HCA03/MFA01 CSCL 05B

The Guide outlines planning, acquisition, implementation and post implementation evaluation considerations for information managers who are responsible for establishing office automation programs. This Guide was developed by Arthur Young & Company for the Information Resources Management Directorate, OASD(C). The Guide is intended to assist the Department in realizing the

opportunities to increase the productivity and effectiveness of professional, administrative, and clerical personnel that are presented by office automation technologies. Author (GRA)

N84-13022# Syracuse Univ., Utica, N. Y.
INFORMATION RETRIEVAL RESEARCH SUPPORT Final Technical Report

J. J. ARLOTTO May 1983 47 p
(Contract F30602-79-C-0195; AF PROJ. 5581)
(AD-A131990; RADC-TR-83-120) Avail: NTIS HCA03/MFA01 CSCL 09B

This report describes work performed by Utica College students of various academic disciplines to undertake study efforts and provide products in the Information Sciences. The report provides a synopsis of the individual investigation study efforts in such areas as information handling information processing, data extraction and data management. When appropriate, individual data gathering efforts were published as separate technical reports under this contract. Author (GRA)

N84-13023# Federal Aviation Administration, Washington, D.C. Office of Management Systems.

INFORMATION RESOURCES MANAGEMENT PLAN

Aug. 1983 208 p
(AD-A131964) Avail: NTIS HCA10/MFA01 CSCL 05A

This Plan documents the Federal Aviation Administration's long-term plan for applying systems analysis and automated data processing technology to its information needs. As a long-range Plan, it provides a sound basis for both the Executive and Legislative Branches to properly appraise funding needs. It retains the flexibility needed to accommodate future technology as it becomes applicable to individual subsystems and it becomes evident that the new technology with improve our return on investment. The Plan begins institutionalizing a process of regular and comprehensive assessments of FAA's information posture and needs. This Plan is the framework for the development, operation, and management of agency information resources and for the regular review of performance as well as resource and priority decisions. The FAA will follow through on this planning effort with the detailed requirements documentation, system specifications, cost benefit analyses, and the other actions sound system management requires. GRA

N84-13030 Rutgers - The State Univ., New Brunswick, N. J.
A STUDY OF CRITICAL FACTORS AFFECTING THE DEVELOPMENT OF PERFORMANCE MEASURES IN EVALUATING BIBLIOGRAPHIC INFORMATION RETRIEVAL SYSTEMS Ph.D. Thesis

J. J. REGAZZI, III 1983 269 p
Avail: Univ. Microfilms Order No. DA8308449

This study is an investigation into critical factors which would constitute reliable performance measures for bibliographic information retrieval systems. Thirty-two (32) judges, grouped by type of judge (researcher or student), level (senior or junior), speciality (biomedicine or social science), and evaluation context (relevance or utility), were asked to rate sixteen (16) documents on alcohol studies which included four (4) different search topics and four (4) document citations and abstracts for each search topic. Half of the judges were asked to rate the documents on how relevant the documents on the basis of the document's perceived utility for the individual judge. After rating the documents, judges were also asked to rate the importance of five (5) document attributes (author, title, abstract, source of publication, and date of publication) and six (6) information attributes (accuracy, completeness, subject, suggestiveness, timeliness, and treatment). The findings of the experiment indicate no significant difference in document rating, document attributes, or information attributes due to the evaluation context. Dissert. Abstr.

N84-13818# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

FORMAL TECHNIQUES IN THE MANAGEMENT OF SOFTWARE DESIGN Ph.D. Thesis

W. E. RICHARDSON 17 Jun. 1983 308 p
(AD-A132569; AFIT/CI/NR-83-28D) Avail: NTIS HCA14/MFA01 CSCL 09B

The inordinately high cost of software continues to be the major shortcoming in the development of computer systems. In the past, attempts to solve this software crisis have been from one of three independent approaches - using structuring techniques or using formal techniques (together these two are called software engineering) or using management techniques. It is now apparent that this management-technology decoupling is avoidable and that a viable software design methodology must include mutually supportive management, structuring, and formal components. This thesis attempts to develop just such a methodology for the design of large systems. The author proposes a set of criteria which will be used to evaluate design methodologies. Based on these criteria and research into existing methodologies, he then outlines his new methodology. It utilizes the advantages of high level abstraction, and extensible set theoretical notation, hierarchical structuring, and numerous management techniques. A simple example is given to introduce the design style and notation. In order to assess the new methodology and its interaction of management and software engineering techniques, he does a case study development of a windowed, information sharing display and filing system. GRA

N84-13827# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.

A TECHNICAL OVERVIEW OF THE NATIONAL SOFTWARE WORKS

R. E. SCHANTZ and R. H. THOMAS Griffiss AFB, N.Y. RADC Mar. 1983 118 p
(Contract F30602-81-C-0213; AF PROJ. 2531)
(AD-A132320; BBN-5238; RADC-TR-83-80) Avail: NTIS HCA06/MFA01 CSCL 09B

This report presents a technical overview of the National Software Works System architecture and design. The NSW is a working example of a network operating system, which is intended to integrate and provide uniform access to software tools residing on a number of constituent host systems connected to the ARPA Network. Author (GRA)

N84-14066# Argonne National Lab., Ill.

TOOLS FOR THE CREATION OF IMS DATABASE DESIGNS FROM ENTITY-RELATIONSHIP DIAGRAMS

G. MARGRAVE, E. L. LUSK, and R. A. OVERBEEK 1983 16 p refs Presented at the 3rd Intern. Conf. on Entity-Relationship Approach, Anaheim, Calif., 5 Oct. 1983 Prepared in cooperation with Univ. of Northern Illinois, De Kalb
(Contract W-31-109-ENG-38)
(DE84-000592; CONF-8310161-1) Avail: NTIS HC A02/MF A01

An overview of a system of software tools that can be used in preparing database designs is presented. The design technique is based on the Entity-Relationship model, the tools allow a designer to conveniently develop an Entity-Relationship model, from which an Extended Entity-Relationship model is produced. The extended Entity-Relationship model is used as input to tools that generate the basic design appropriate to the target database management system. DOE

N84-14730# European Space Agency, Paris (France).

INTEGRATED SOFTWARE ENGINEERING FACILITIES (ISEF)

G. MOSTINI (CERCI, Fontenay-sous-Bois, France) In ESA Software Eng. p 3-6 Aug. 1983 refs
Avail: NTIS HC A13/MF A01

The ISEF, a prototype of a programming environment to be used by ESA for developing and maintaining software products is introduced. The ISEF implements and validates software development methodologies. It is implemented on VAX under UNIX (trademark) operating system. It uses RAPPORT (trademark) a

relational data base management system. It is a multiusers multiprojects software workshop. It applies throughout the whole life cycle of a software product from requirements definition to acceptance and maintenance phases. It helps in controlling the consistency of the product and managing its development.

Author (ESA)

N84-14732# European Space Agency, Paris (France).

THE INTEGRATED SOFTWARE ENGINEERING FACILITIES (ISEF) SOFTWARE CONFIGURATION MANAGEMENT SYSTEM

L. DIAKITE In ESA Software Eng. p 19-23 Aug. 1983 refs
Avail: NTIS HC A13/MF A01

A configuration management system consisting of three independent layers, integrated by a procedure, was developed. The on-line modification request control system uses a modification request database to provide all the information on a project. It helps follow up the evolution of a system and the different versions of its components, and can produce all types of reports. A version management system provides the archiving capabilities. It uses the same archive file to store a module and its updates, thus helping to control source and text files. The ISEF also supports formal requirements and design languages. Formal documents can be archived. A system generation tool produces executable images and prints documents, graphs, updates, etc, using Make a standard tool of Unix. The Make's work is driven by a file which shows how a program can be built from its components. The Make also accepts shell commands for printing. Author (ESA)

N84-14735# Technische Univ., Vienna (Austria). Inst. fuer Angewandte Informatik und Systemanalyse.

EDDA: A VERY HIGH LEVEL DATA FLOW SPECIFICATION LANGUAGE

H. KERNER, H. MOTSCHNIG, R. PITRIK, and W. TRATTNIG In ESA Software Eng. p 37-47 Aug. 1983 refs
Avail: NTIS HC A13/MF A01

A design language (EDDA) which has the graphical form and functional decomposition philosophy of the Structured Analysis and Design Technique (SADT) but adds all features necessary to promote it from the level of a pseudo code to a very high level language, that combines design and programming capabilities was developed. Changes to SADT are: a syntax and semantics for all operations; a clear data concept with operations for data manipulation; and additional operations for data, process, and resource abstraction. The resulting language is based on the application of functions which compute values and do not cause any side effects. Being a functional language, EDDA is employable for the design of distributed systems which involve parallel operations and their synchronization. In the process of continuous refinement a functional program is created, which can be executed on a data flow computer or on an equivalent abstract machine simulated on a von Neumann computer. Author (ESA)

N84-14737# Gesellschaft fuer Elektronische Informationsverarbeitung m.b.H., Aachen (West Germany).

THE SOFTWARE ENGINEERING ENVIRONMENT PROJECT MODEL (PROMOD)

P. HRUSCHKA In ESA Software Eng. p 59-63 Aug. 1983 refs
Avail: NTIS HC A13/MF A01

A software engineering environment (PROMOD) based on standard methods such as structured analysis and information hiding was produced to guide developers from problem analysis to acceptance test. It comprises interactive tools to give immediate feedback at every stage of the development of systems. Although oriented towards modern programming languages PROMOD is language independent. It is based on a life cycle model which establishes a relation between phases of development, procedures, and resulting documents, methods, and tools. It is available on PDP 11 under RSX, on VAX under VMS, and on a 16 bit microcomputer under MS-DOS. Author (ESA)

N84-14742# Marconi Space and Defence Systems Ltd., Portsmouth (England).

SOFTWARE CONFIGURATION MANAGEMENT

B. R. YOUNG /in ESA Software Eng. p 105-114 Aug. 1983 refs

Avail: NTIS HC A13/MF A01

The manner in which traditional configuration management practices are adopted to reach the individual components of a software system is outlined. The tools and procedures developed to extend practical control down to individual code modules are described. The concept of software packages; the codes of practice to cover module identification and media issue; and the software tools to enable direct package content control and printout of module status are considered.

Author (ESA)

N84-14748# TECSI-Software, Paris (France).

COHERENT MANAGEMENT SUPPORT IN THE ADA ENVIRONMENT

K. RIPKEN /in ESA Software Eng. p 161-166 Aug. 1983

Avail: NTIS HC A13/MF A01

Methods and tools for supporting the development and maintenance of large scale software systems written in Ada were studied. The integration of the methods and tools for the whole range of software life cycle activities was emphasized. A coherent management support scheme was synthesized in an Ada programming support environment. The major coherency aspects of this scheme are described.

Author (ESA)

N84-14749*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

ADA AND THE NASA SOFTWARE ENVIRONMENT

E. W. NG and R. LOESH /in ESA Software Eng. p 167-168 Aug. 1983

(Contract NAS7-100)

Avail: NTIS HC A13/MF A01

The NASA software, in broad categories, is described, and the software life cycle is characterized. Programming language policy and practices are reviewed. Applicability, benefits, and transition, as well as present and potential problems with Ada are examined.

Author (ESA)

N84-14751# Softlab G.m.b.H., Munich (West Germany).

THE PROJECT LIBRARY PLUS: A GENERAL OVERVIEW

F. PFEIFROTH /in ESA Software Eng. p 175-183 Aug. 1983 refs

Avail: NTIS HC A13/MF A01

A project library (PLUS) used with the PET/MAESTRO software development system is described. The structure of the project library is defined by three dimensions: product structure; document structure; and versions. The PLUS provides project library services for administration of development material and for support standards, methods and so on; and project management services for task distribution and for the control of execution costs and dates.

Author (ESA)

N84-14753# Ferranti Computer Systems Ltd., Cwmbran (England).

A HOST-TARGET PROGRAMMING SUPPORT ENVIRONMENT FOR THE PRODUCTION OF HIGH-QUALITY REAL-TIME SYSTEMS

E. J. DOWLING and B. E. AVIS /in ESA Software Eng. p 191-198 Aug. 1983 refs

Avail: NTIS HC A13/MF A01

Hardware and software components of an environment used for the production of large, real time systems are discussed, together with the reasons behind the choices made. Many software tools come directly from the host system (a DEC VAX with VMS) but tools for software (configuration) management and software verification were developed. Ada and Ada program support environments are contrasted with features of the environment currently used.

Author (ESA)

N84-14766# Intermetrics, Inc., Cambridge, Mass.

COMPUTER PROGRAM DEVELOPMENT SPECIFICATION FOR ADA INTEGRATED ENVIRONMENT: KAPSE (KERNEL ADA PROGRAMMING SUPPORT ENVIRONMENT)/DATABASE, TYPE B5, B5-AIE(1).KAPSE(1)

12 Nov. 1982 182 p

(Contract F30602-80-C-0291)

(AD-A134092; IR-678-2) Avail: NTIS HCA09/MFA01 CSCL 09B

This specification establishes the requirements for performance, design, test, and qualification of a set of computer program modules identified as the Kernel Ada Programming Support Environment (KAPSE) of the Ada Integrated Environment. The KAPSE provides several facilities to the Ada Programming Support Environment, which can be grouped into the following five Computer Program Configuration Items: (1) SIMPCOMP - Database Operations on Simple and Composite Objects; (2) ACCECAT - Access Control and Categorization of Database Objects, and the Manipulation of User-Defined Attributes; (3) MULTPROG - Invocation of and Communication Between Multiple Ada Programs, plus Multi-User and Multi-KAPSE Support and Synchronization; (4) HISTARCH - Configuration and System Management, with History, Archiving, Backup, and Recovery; and (5) RTS - Run-Time Support for the Execution of Ada Programs, including Language-Defined Input/Output Packages. This specification identifies the functional capabilities of the various KAPSE computer program components and describes the KAPSE/tool interfaces as well as the KAPSE/Host computer interfaces.

GRA

N84-14968# Oak Ridge Y-12 Plant, Tenn.

INTERACT EXECUTE FACILITY FOR JOB SCHEDULING AND MANIPULATION

J. T. MOORE Oct. 1983 65 p Presented at the Cullinet User's Week, New Orleans, 3 Oct. 1983

(Contract W-7405-ENG-26)

(DE84-001653; Y/CSD/INF-83/3; CONF-8310190-1) Avail:

NTIS HC A04/MF A01

The INTERACT's execute facility and command set which provide a very obvious and simple mechanism for computerizing the computer operations department are outlined. A production oriented shop has a large volume of batch jobs that are submitted on a regular schedule and these jobs are usually grouped into systems. Furthermore, within these systems, individual jobs that are related, if not dependent on each other, sometimes have to run in a particular sequence. It's usually the responsibility of a setup group within the computer operations department to see that these jobs are submitted on schedule, the results are checked, a predefined procedure is followed when things go wrong, and reports are distributed to appropriate people out in the field. An online system, the JES3 NETWORK MANAGER, using INTERACT and its execute facility to handle these functions is presented.

DOE

N84-14980# Naval Postgraduate School, Monterey, Calif.

THE DETERMINATION OF USER INFORMATION REQUIREMENTS DURING THE DEVELOPMENT OF MANAGEMENT INFORMATION SYSTEMS M.S. Thesis

P. R. GARDELLA, JR. Jun. 1983 137 p

(AD-A132998) Avail: NTIS HCA07/MFA01 CSCL 05B

One of the major causes for the failure of Management Information Systems (MIS) is that these do not satisfy the user's information requirements. This, in turn, is most often caused by the fact that those requirements are difficult to obtain accurately and completely. Simply asking the user what he needs is inadequate. This thesis reviews the Information Requirements Analysis literature, briefly describing some of the techniques available for determining the users' information requirements. It then reports on a survey which attempted to investigate the degree to which the extensive MIS literature involving information requirements determination has had practical impact on the way in which MIS's are actually developed.

Author (GRA)

05 COMPUTERS AND INFORMATION MANAGEMENT

N84-14983# Pacific Northwest Lab., Richland, Wash.

ALDS PROJECT: MOTIVATION, STATISTICAL DATABASE MANAGEMENT ISSUES, PERSPECTIVES, AND DIRECTIONS

J. J. THOMAS and D. L. HALL Sep. 1983 8 p refs Presented at the 2nd Intern. Statistical Database Management Workshop, Los Altos, Calif., 27-29 Sep. 1983

(Contract DE-AC06-76RL-01830)

(DE84-001412; PNL-SA-11513; CONF-830950-1) Avail: NTIS HC A02/MF A01

A new direction in the analysis of large data sets was established. The ALDS project is composed of a team of statisticians and computer scientists. The motivation and initial goals of the ALDS project, the impact of large data sets, the data management issues addressed by ALDS, current research tasks and their impact on statistical data base management, and perspectives is discussed. DOE

N84-16432# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

AN EXPLORATORY STUDY OF THE USE OF AN INEXPENSIVE CORDLESS TELEPHONE AS A PART OF A DATA COMMUNICATIONS LINK M.S. Thesis

E. B. MORGAN, JR. 26 Aug. 1983 134 p

(AD-A134228; AFIT/CI/NR-83-54T) Avail: NTIS HC A07/MF A01 CSCL 17B

This was an exploratory study performed to identify some of the variables contributing to the accuracy of data transmission using a cordless telephone as a part of a data communications link. The experimental design used was a fractional factorial design using two, one-quarter replications of all possible combinations of the eight variables studied. Independent variables manipulated included distance, height of receiver, antenna length, and antenna angle from the vertical. Other independent variables included the presence or absence of operating fluorescent lights, an intervening metal cabinet, an intervening wall and door, and an intervening human body. The dependent variable measured was the percentage of 13 character number strings received which matched identical records previously stored in a computer. GRA

N84-16824*# Massachusetts Inst. of Tech., Cambridge. Center for Information Systems Research.

THE DYNAMICS OF SOFTWARE DEVELOPMENT PROJECT MANAGEMENT: AN INTEGRATIVE SYSTEMS DYNAMIC PERSPECTIVE

W. E. VANDERVELDE and T. ABDEL-HAMID Jan. 1984 522 p refs

(Contract NAGW-448)

(NASA-CR-175342; NAS 1.26:175342; SDM-TR-18; MSD-1)

Avail: NTIS HC A22/MF A01 CSCL 09B

Rather than continuing to focus on software development projects per se, the system dynamics modeling approach outlined is extended to investigate a broader set of issues pertaining to the software development organization. Rather than trace the life cycle(s) of one or more software projects, the focus is on the operations of a software development department as a continuous stream of software products are developed, placed into operation, and maintained. A number of research questions are "ripe" for investigating including: (1) the efficacy of different organizational structures in different software development environments, (2) personnel turnover, (3) impact of management approaches such as management by objectives, and (4) the organizational/environmental determinants of productivity. B.G.

N84-16830# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

MICROCOMPUTER SOFTWARE SYSTEM DEVELOPMENT: SUGGESTED REVISIONS TO MIL-STD-1521A FOR COST-EFFECTIVE ACQUISITION OF CUSTOM SOFTWARE THROUGH SOFTWARE ENGINEERING M.S. Thesis

V. M. HELBLING Sep. 1983 107 p

(AD-A134363; AFIT-LSSR-10-83) Avail: NTIS HC A06/MF A01 CSCL 05A

DOD annual investment in computer systems, much of it in micro-computers, will be \$38 billion by 1990, up 900 percent from 1980. Software maintenance costs will be 64 percent of the 1990 total, or more than \$24 billion. Software maintenance can be greatly reduced through systemic software development as prescribed by MIL-STD-1521A, but DOD managers complain that the process, originally designed for the acquisition of multi-million dollar mainframe systems, not for microcomputers, is much too slow, and therefore not cost effective. Data automation experts point out, however, that development haste in conflict with 1521A increases future maintenance costs. This thesis displays the problem using a recent case study from the Alaskan Air Command, and presents a new acquisition procedure incorporating microcomputer software engineering techniques which reduce system development time while preserving high software quality as intended by the regulations. Author (GRA)

N84-16831# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

A METHOD FOR DESIGNING COMPUTER SUPPORT DOCUMENTATION M.S. Thesis

R. E. BEARD, JR. and P. V. CALLAMARAS Sep. 1983 166 p

(AD-A134466; AFIT-LSSR-54-83) Avail: NTIS HC A08/MF A01 CSCL 09B

Current computer support documentation, user's manuals, fail to communicate effectively with the modern computer user. Most documentation exhibit inadequate direction, confusing organization, and overall poor design, and thus are hard to use. A review of documentation techniques used by government, academic, commercial, and private technical writers revealed effective techniques are well known but are often not applied to current documentation. Technical writers continue to produce ineffective manuals because no comprehensive preparation method exists. The comprehensive method presented in this thesis includes: documentations proper role in the computer system in describing the logical relationships between system elements; the technical writer's role in the systems design team of converting user desires into specifications and system descriptions into user understandable information; and an overall hierarchical and structured approach to document design similar to that used in software engineering. Also provided is a modeling technique to help evaluate computer system design decisions. GRA

N84-17049# Computer Sciences Corp., Falls Church, Va.

RECOMMENDED TEST AND EVALUATION AND INDEPENDENT VERIFICATION AND VALIDATION ACTIONS FOR THE DEFENSE DATA NETWORK Final Technical Report, Jun. - Aug. 1983

Aug. 1983 69 p

(Contract DCA100-78-C-0053)

(AD-A134167; CSC-DDN-TE-1) Avail: NTIS HC A04/MF A01 CSCL 05A

This report identifies all Defense Data Network (DDN) testable components (hardware, software), assemblies, subsystems, integrated facilities, and subsystems; to describe the specific nature and objective of the tests required to assure proper network performance, including recommended schedules and locations; and to recommend which software and firmware developments should be monitored by Independent Verification, Validation, and Test. The objective of this report is to provide to the Government, in an easily accessible form, information needed for the development of a Test and Evaluation Master Plan (TEMP) for the DDN. GRA

N84-17054# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

INFORMATION NEEDS AND SYSTEM SPECIFICATIONS FOR THE B-1B EXECUTIVE INFORMATION SYSTEM M.S. Thesis
D. E. MORGAN and G. H. STILWELL Sep. 1983 110 p
(AD-A134424; AFIT-LSSR-36-83) Avail: NTIS HC A06/MF A01 CSCL 05B

This thesis provides the B-1B Program Office with assistance in development of their executive information system. To achieve this purpose, two research objectives were identified. The first objective was to identify the information needs of the B-1B executive management team not currently satisfied by the existing computer-based information system. The second objective was to determine and document the system specifications to support these needs. To achieve these research objectives, a structured systems approach, IDEFO, was used to develop a functional model of the management activities within the B-1B Program Office. The specific information needs were identified and documented. Also, system specification needs were identified and documented. System specifications identified by the executive managers as most important to them concern security, ease of system operation, trend analysis and forecasting, and interface with contractor information systems. Recommendations to the program office address data base management, centralization/decentralization of software development, system documentation, and operational control of system hardware and software. The results of this study should be applicable to efforts to automate information systems in major weapon system program offices. Author (GRA)

N84-17069# Department of Trade and Industry, London (England). Scientific and Technical Information Unit.

DATA ORGANISATIONS AND THEIR MANAGEMENT

J. R. SUTTON /in AGARD Develop. and Use of Numerical and Factual Data Bases 12 p Oct. 1983
Avail: NTIS HC A06/MF A01

Organizations which are involved in generating, compiling, validating and disseminating data are not all alike. Different types of organizations have different objectives and motivations. These lead to differences in management. Ways of coordinating the activities of data organizations are considered and the scope for overall planning at national and international levels. The costs of data activities cannot be ignored. The economics of subsidies, pump priming and pricing need careful consideration. Author

N84-17891# Mitre Corp., Bedford, Mass.
HQ AFSC SELECTION OF A MICROPROCESSOR DEVELOPMENT SYSTEM
C. H. PRICE, JR. Oct. 1983 62 p
(Contract F19628-82-C-0001)
(AD-A134930; MTR-8866; ESD-TR-83-205) Avail: NTIS HC A04/MF A01 CSCL 05A

A microprocessor development system is essential to the system design laboratory where it is used to develop, test, and debug microprocessor-based circuitry and software. This report describes the functions and components of a typical development system, provides vendor selection criteria, and compares the characteristics of three proven or representative systems to determine the one most suitable for acquisition by HQ AFSC.

Author (GRA)

N84-17927# State Univ. of New York, Stony Brook. Dept. of Computer Science.

COMPUTER NETWORKS WITHOUT A SHARED MEMORY AFOSR-81-0197 Interim Report

A. J. BERNSTEIN Jul. 1983 7 p
(Contract AF-AFOSR-0197-81; AF PROJ. 2304)
(AD-A135074; AFOSR-83-0930TR) Avail: NTIS HC A02/MF A01 CSCL 09B

The research performed under this grant centers on the concept of a network computer. By this the authors mean a network of computers (no shared memory) which can be programmed as if it were a single virtual machine using a high level distributed language. Work during this past year can be divided into three

areas: Distributed Algorithms; Distributed Languages; and An Implementation of Multicasting on a Network Computer. This report summarizes progress achieved during the past year.

Author (GRA)

N84-18107# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

A PROGRAM FOR DEVELOPING AUTOMATED SCIENTIFIC-INFORMATION PROCESSING IN MARITIME ECONOMY

T. CIUNDZIEWICKI and T. PIOTROWSKI 17 Nov. 1983 11 p
Transl. into ENGLISH from Techn. i Gospodarka Morska (Poland), v. 27, no. 4(310), Apr. 1977 p 205-206
(AD-A135518; FTD-ID(RS)T-1525-83) Avail: NTIS HC A02/MF A01 CSCL 05B

The need for efficient means to acquire scientific and technical information is addressed. The shortcomings of the present automated systems are surveyed. Finally, basic requirements for further development of an automated scientific information system are outlined. J.M.S.

N84-18619# Carnegie-Mellon Univ., Pittsburgh, Pa. Inst. of Technology.

WORKSHOP ON MAGNETIC INFORMATION TECHNOLOGY (MINT)

A. B. BORTZ and S. B. DUNKLE 1983 41 p refs Workshop held in Washington, 22-24 Jun. 1983
(Contract NSF OIR-83-12023)
(PB84-125210; NSF/OIR-83002) Avail: NTIS HC A03/MF A01 CSCL 14C

Questions addressed at the workshop are listed, including: (1) What are the Magnetic Information Technology (MINT) research needs in such areas as electronics, materials, surface science, magnetic phenomena and devices, aerodynamic aspects of magnetic systems, signal processing, and tribology as it bears on magnetics, (2) How should MINT research be addressed and conducted in the university environment, and (3) What are the vehicles in the university environment needed to facilitate addressing MINT issues. The MINT research is outlined. The need for research in the following areas is identified: magneto-optic recording, magnetic bubbles, particulate material recording, and thin film media. GRA

N84-18945# CRC Systems, Inc., Fairfax, Va.
GUIDE TO SOFTWARE CONVERSION MANAGEMENT Final Report

M. SKALL, ed. Washington NBS Oct. 1983 215 p refs
(PB84-118314; NBS-SP-500-105; LC-83-600589) Avail: NTIS HC A10/MF A01 CSCL 09B

This guideline was developed to provide federal ADP managers a better understanding of the entire process of software conversion. Software conversions have life cycles with distinct phases and activities that occur in each phase. Understanding the order or sequence of a conversion and of the associated costs should help managers to plan and execute software conversions efficiently, effectively, and with minimum operations disruption to federal agencies. Although extensive references were consulted in preparing this guideline, the most important sources were interviews conducted at 14 federal agencies that had completed or were involved in software conversion projects. These interviews influenced the structure and organization of this guideline in an attempt to present, in logical order, activities that must be performed to achieve a successful conversion. GRA

N84-18952# National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.

GUIDANCE ON SOFTWARE MAINTENANCE Final Report

R. J. MARTIN and W. M. OSBORNE Dec. 1983 75 p refs
(PB84-128951; NBS-SP-500-106; LC-83-600611) Avail: NTIS HC A04/MF A01 CSCL 09B

Issues and problems of software maintenance are addressed and actions and procedures which can help software maintenance organizations meet the growing demands of maintaining existing

05 COMPUTERS AND INFORMATION MANAGEMENT

systems are suggested. A working definition for software maintenance is established. Tools and techniques that may be used to improve the control of software maintenance activities and the productivity of a software maintenance organization are discussed. Emphasis is placed on the need for strong, effective technical management control of the software maintenance process. GRA

N84-19170# University of Southern California, Los Angeles. Dept. of Computer Science.

DESIGN OF OFFICE INFORMATION SYSTEMS

E. HOROWITZ and B. NARASIMHAN 8 Nov. 1983 33 p
(Contract AF-AFOSR-0232-82; AF PROJ. 2304)
(AD-A136523; AFOSR-83-1253TR) Avail: NTIS HC A03/MF A01 CSCL 05A

We outline the essential components of a truly integrated OIS. Then we critically examine four of the existing prototype systems and another suggested design. These systems have the common characteristic of providing a form based user interface. Then we present a set of requirements for such an OIS. GRA

N84-19176# Stanford Univ., Calif. Dept. of Computer Science. **UNIVERSAL RELATION DATABASE SYSTEMS Annual Report, 1 Sep. 1982 - 31 Aug. 1983**

J. D. ULLMAN Aug. 1983 7 p
(Contract AF-AFOSR-0212-80; AF PROJ. 2304)
(AD-A135707; AFOSR-83-0962TR) Avail: NTIS HC A02/MF A01 CSCL 05B

The query facility for their universal relation database system is now working. The fundamental paper unifying ideas on what a UR system can and should be has been published. A paper surveying developments in the field of universal relation systems was invited for the triennial IFIP Congress and was delivered in September. Some initial results on logical theories applied to the problem of updating views have been obtained. There have been a number of developments concerning inference of inclusion dependencies and on the complexity of deciding certain properties of data base schemes. Some interesting results on the difficulty of obtaining hash functions that work well for particular sets of data have been obtained and won an award. Author (GRA)

N84-19179# European Space Agency, Paris (France). **THE APOLLO CONCEPT: ELECTRONIC DOCUMENT DELIVERY BY SATELLITE**

Apr. 1983 113 p refs
(ESA-SP-1048; EUR-8589-EN) Avail: NTIS HC A06/MF A01

Electronic document delivery via the European Communications Satellite, the Apollo system, is described. Document identification and ordering; Apollo operation; document digitization; characteristics of the products; transmission errors and image quality; the document terminal; the archive; and the satellite transmission system are outlined. Author (ESA)

N84-20244# Naval Ship Research and Development Center, Bethesda, Md. Computation Mathematics/Logistics Dept. **COMPUTER GENERATION OF PLAN OF ACTION AND MILESTONE SCHEDULE Final Report**

A. SHUFORD and S. BECKER Nov. 1983 83 p
(AD-A137057; DTNSRDC-CMLD-83/27) Avail: NTIS HC A05/MF A01 CSCL 09B

The Computer Generated Plan of Action and Milestones (POAM) Program was developed to generate a Plan of Action and Milestones Chart using computer graphics. These charts are used in reports and system Decision Papers. The charts show the progress and methodology of a project. The original charts were generated by hand (ruler and pencil with a final typed copy) and by graphics procedures. The computer program will enable the user to generate these graphs faster, and more efficiently. The program uses Fortran, and Display Integrated Software System and Plotting Language (DISSPLA). DISSPLA is a software package that enables the user to produce graphics. The user is advised to become familiar with the introductory portions of the DISSPLA

manual. This manual explains how POAMs are produced through interactive and batch computer methods. GRA

N84-20425# Meridian Corp., Falls Church, Va. **REQUIREMENTS ANALYSIS FOR FORWARD FUNDING TRACKING SYSTEM, VOLUME 1 Final Report**

1 Dec. 1983 49 p
(Contract MDA903-83-C-0342)
(AD-A136840) Avail: NTIS HC A03/MF A01 CSCL 05A

Volume I of this report focuses on the efforts undertaken with respect to the requirements for a Forward Funding Tracking System. The purpose of this effort was to analyze the feasibility and cost effectiveness of developing a forward funding tracking system which was capable of utilizing existing DARPA data bases. Used in this context, forward funding tracking refers to the process by which DARPA commits, obligates, and ultimately manages its fiscal resources. The motivation behind this analysis was the need to provide the DARPA Program Management Office (PMO) with sufficient information to enable an informed decision regarding the effectiveness of potential approaches to financial management. This need is a principal concern to the PMO, since it is the responsibility of this office to plan, manage, and control, at the aggregate level, DARPA program funds and project scheduling. In addition, within the context of the overall DARPA mission to pursue high-risk, high-payoff R&D, it is incumbent upon the technical program offices to manage individual projects from a technical, cost, and schedule point of view. Consequently, the coordination of the resource requirements for management of these individual projects is also a primary concern to the PMO. GRA

N84-20426# Meridian Corp., Falls Church, Va. **REQUIREMENTS ANALYSIS FOR MILESTONE TRACKING SYSTEM, VOLUME 2 Final Report**

1 Dec. 1983 17 p
(Contract MDA903-83-C-0342)
(AD-A136841) Avail: NTIS HC A02/MF A01 CSCL 05B

Volume II of this report concerns the efforts undertaken with respect to a Milestone Tracking System. The purpose of this task was to analyze the feasibility and cost effectiveness of developing milestone tracking system for internal use within DARPA which was capable of utilizing existing DARPA data bases. As defined in this document, milestones include a wide range of internal and external developments as well as decision points which may be of interest to DARPA managers. Specifically, these include: Technical achievements; Technical decision points; Financial decision points; Point of inter-project dependencies; and External events/considerations. The purposes initially identified for a milestone tracking system were threefold. First, the system was envisioned to be a mechanism to provide program managers with a concise representation of their program activities. Second, the system was conceived to provide an automatic prompting of milestone and/or critical events identified by the user. Third, the system was viewed as a mechanism to retain an historical data base on the conduct of DARPA programs. It soon became evident that the system also had utility in providing input to programming decisions through the analysis of imbedded dependency networks. GRA

N84-20438# Naval Postgraduate School, Monterey, Calif. **BENCHMARKING THE SELECTION AND PROJECTION OPERATIONS AND ORDERING CAPABILITIES OF RELATIONAL DATABASE MACHINES M.S. Thesis**

R. A. BOGDANOWICZ Sep. 1983 68 p
(AD-A136776) Avail: NTIS HC A04/MF A01 CSCL 09B

This thesis describes the performance-measurement experiments designed for a number of back-end, relational database machine configurations. An in-depth study of the tests and results of the two relational operations, namely, selection and projection, on a specific configuration is presented. In addition, tests are made on the ordering capabilities and performance of the machine configuration. The goal of the work is to lead to a development for a machine-independent methodology for

benchmarking the selection and projection operations and on ordering capabilities of database machines. Author (GRA)

N84-20442# National Aerospace Lab., Amsterdam (Netherlands). Informatics Div.

SECURITY, A SET OF RULES OR AN APPROACH

R. P. DEMOEL 27 Sep. 1982 16 p refs In DUTCH; ENGLISH summary Presented at Cryptography Course, Amsterdam, 4-8 Oct. 1982

(NLR-MP-82047-U) Avail: NTIS HC A02/MF A01

Computer information security measures are examined. Encryption of data as a protection against unauthorized examination is discussed. Protective mechanics, general security directives derived from conventional security, and management security considerations are reviewed. Author (ESA)

N84-21204 Illinois Inst. of Tech., Chicago.

APPLICATIONS OF OPERATIONS RESEARCH AND MANAGEMENT INFORMATION SYSTEM CONCEPTS TO MANAGEMENT OF LARGE SOFTWARE PROJECTS Ph.D. Thesis

J. H. LEE 1983 159 p

Avail: Univ. Microfilms Order No. DA8400839

As demands for large-scale software systems increase, improvement of software productivity has become an important goal. Achieving this goal requires efficient management of software development staff and computing resources through effective and timely planning and control decisions. Such decisions are possible when software systems are decomposed into components and life-cycle stages of developing these components are mathematically modeled. Incorporating staff consumption, resource usage and their relationships with time as tradeoffs into the model, the minimum cost, minimum duration and maximum profit project plans can be generated. For generating the plans, heuristic algorithms are formulated. The algorithms attempt to search for close-to-optimal project milestones, and from them, derive staff and resource needs. Reduction of the resulting computational cost, when compared with analytical methods, is significant. Three operations research oriented project management algorithms are presented. Dissert. Abstr.

N84-21396# Department of Energy, Oak Ridge, Tenn. Data Processing Div.

MANAGEMENT OF AEROSPACE CONTRACT DOCUMENTATION BY INDUSTRY AND GOVERNMENT

E. G. COPPOCK 1983 18 p Presented at the NATO Conf. on the Appl. of New Technol. to Improve the Delivery of Aerospace and Defense Inform., Ottawa (Canada), 14-15 Sep. 1983

(DE84-900451; CONF-8309188-1) Avail: NTIS HC A02/MF A01

Methods of documenting and tracking contract requirements and deliverables from the inception of a project through its completion were reviewed. A specific system, the technical information monitoring system is discussed. The tracking of deliverables in the form of technical reporting requirements for research and development contracts are emphasized. The application of new technologies to improve productivity and reduce overlap in energy research and development, to enhance contract documentation, accelerate the dissemination of contractor research and development reports and technical information are outlined. DOE

N84-21402# RAND Corp., Santa Monica, Calif.

INFORMATION SYSTEMS, SECURITY AND PRIVACY

W. H. WARE Nov. 1983 20 p refs Presented at Subcomm. on Transportation, Aviation and Mater., Comm. on Sci. and Technology, U.S. House of Representatives, Washington, D.C., 24 Oct. 1983

(RAND/P-6930; AD-A145193) Avail: NTIS HC A02/MF A01

A brief overview concerning the security of information and computer systems was presented and the relationship between security and personal privacy was examined. Record keeping privacy concerns protecting personal information and controlling its use for authorized purposes. Computer security provides

protective mechanisms that assure computer system safety and protect the stored information including access to that information. Defense environment security was contrasted with commercial security. Threats against Department of Defense security involve large technical and financial resources of major world powers while the industrial threat is comparatively minor and involves authorized individuals using the system for personal gain. Several suggestions for the improvement of security for computer software and the related systems are presented, including preparation of a standard government handbook listing preferred procedures for running a computer center, clarification of personal privacy laws, and vendor obligations regarding security safeguards. M.A.C.

N84-21405*# National Aeronautics and Space Administration, Washington, D. C.

ACTION INFORMATION MANAGEMENT SYSTEM (AIMS): A USER'S VIEW

M. WISKERCHEN *In its* NASA Admin. Data Base Management Systems, 1983 p 9-12 Apr. 1984

Avail: NTIS HC A08/MF A01 CSCL 05B

The initial approach used in establishing a user-defined information system to fulfill the needs of users at NASA Headquarters was unsuccessful in bringing this pilot endeavor to full project status. The persistence of several users and the full involvement of the Ames Research Center were the ingredients needed to make the AIMS project a success. The lesson learned from this effort is that NASA should always work from its organizational strengths as a Headquarters-Center partnership. A.R.H.

N84-21406*# National Aeronautics and Space Administration, Washington, D. C.

AUTOMATED RTOP MANAGEMENT SYSTEM

P. HAYES *In its* NASA Admin. Data Base Management Systems, 1983 p 13-18 Apr. 1984

Avail: NTIS HC A08/MF A01 CSCL 05B

The structure of NASA's Office of Aeronautics and Space Technology electronic information system network from 1983 to 1985 is illustrated. The RTOP automated system takes advantage of existing hardware, software, and expertise, and provides: (1) computerized cover sheet and resources forms; (2) electronic signature and transmission; (3) a data-based information system; (4) graphics; (5) intercenter communications; (6) management information; and (7) text editing. The system is coordinated with Headquarters efforts in codes R,E, and T. A.R.H.

N84-21411*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

AUTOMATED ADMINISTRATIVE DATA BASES

M. D. MARRIE, J. R. JARRETT, S. A. REISING, and J. E. HODGE *In* NASA. Goddard Space Flight Center NASA Admin. Data Base Management Systems, 1983 p 85-88 Apr. 1984

Avail: NTIS HC A08/MF A01 CSCL 05B

Improved productivity and more effective response to information requirements for internal management, NASA Centers, and Headquarters resulted from using automated techniques. Modules developed to provide information on manpower, RTOPS, full time equivalency, and physical space reduced duplication, increased communication, and saved time. There is potential for greater savings by sharing and integrating with those who have the same requirements. A.R.H.

N84-21412*# Maryland Univ., College Park. Dept. of Computer Science.

METHOD FOR ACCESSING DISTRIBUTED HETEROGENEOUS DATABASES

B. E. JACOBS *In* NASA, Washington NASA Admin. Data Base Management Systems, 1983 p 89-104 Apr. 1984

Avail: NTIS HC A08/MF A01 CSCL 05B

A scenario of relational, hierarchical, and network data bases is presented and a distributed access view integrated data base system (DAVID) is described for uniformly accessing data bases which are heterogeneous and physically distributed. The DAVID

05 COMPUTERS AND INFORMATION MANAGEMENT

system is based on data base logic so that the relational approach is generalized to the heterogeneous approach. The global data manager is explained as are global data manipulation languages which can operate on all the data bases and can query the data dictionary and the data directory. A.R.H.

N84-21415*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

NASA-WIDE STANDARD ADMINISTRATIVE SYSTEMS

P. SCHNECK *In* NASA. Goddard Space Flight Center NASA Admin. Data Base Management Systems, 1983 p 145-152 Apr. 1984

Avail: NTIS HC A08/MF A01 CSCL 05B

Factors to be considered in developing agency-wide standard administrative systems for NASA include uniformity of hardware and software; centralization vs. decentralization; risk exposure; and models for software development. A.R.H.

N84-21433# Defence Research Information Centre, Orpington (England).

THE APPLICATION OF MANAGEMENT TECHNIQUES TO DEFENCE AND OTHER INFORMATION SERVICES: THE BRITISH APPROACH

G. W. HART *In* AGARD The Appl. of New Technol. to Improve the Delivery of Aerospace and Defence Inform. 16 p Dec. 1983 refs

Avail: NTIS HC A06/MF A01

The Aslib catalog was searched for books, reports, and periodical articles on applications of management techniques to information services and libraries which were published in Great Britain or written by British authors. Also the last eight years of Aslib Proceedings were searched and an on-line search of the LISA (Library and Information Science Abstracts) files was conducted. A logical approach was made, from planning a new system, through measurement and evaluation, to the application of different technique for improvement of a system, finishing with the more esoteric ones. The aim throughout was to give the flavor of a technique rather than a detailed description. Author

N84-21434# Department of Energy, Oak Ridge, Tenn. Data Processing Div.

MANAGEMENT OF AEROSPACE CONTRACT DOCUMENTATION BY INDUSTRY AND GOVERNMENT

E. G. COPPOCK *In* AGARD The Appl. of New Technol. to Improve the Delivery of Aerospace and Defence Inform. 17 p Dec. 1983

Avail: NTIS HC A06/MF A01

Method of documenting and tracking contract requirements and deliverables from the inception of a project through its completion are reviewed. One specific system, the Technical Information Monitoring System, is discussed in detail. Emphasis is placed on the tracking of deliverables in the form of technical reporting requirements for research and development contracts for the U.S. Department of Energy. In addition, the application of new technologies to improve productivity and reduce overlap in energy research and development are examined and to enhance contract documentation and accelerate the dissemination of contractor research and development reports and technical information. Author

N84-22211*# Boeing Computer Services, Inc., Seattle, Wash. **MANAGING GEOMETRIC INFORMATION WITH A DATA BASE MANAGEMENT SYSTEM**

R. P. DUBE *In* NASA. Langley Research Center Computer-Aided Geometry Modeling p 241-254 Mar. 1984 refs

Avail: NTIS HC A17/MF A01 CSCL 09B

The strategies for managing computer based geometry are described. The computer model of geometry is the basis for communication, manipulation, and analysis of shape information. The research on integrated programs for aerospace-vehicle design (IPAD) focuses on the use of data base management system (DBMS) technology to manage engineering/manufacturing data. The objectives of IPAD is to develop a computer based engineering

complex which automates the storage, management, protection, and retrieval of engineering data. In particular, this facility must manage geometry information as well as associated data. The approach taken on the IPAD project to achieve this objective is discussed. Geometry management in current systems and the approach taken in the early IPAD prototypes are examined. E.A.K.

N84-22281# California Univ., Berkeley. Lawrence Berkeley Lab. Computer Science and Mathematics Dept.

COMPUTER-ASSISTED INFORMATION GRAPHICS FROM THE GRAPHIC DESIGN PERSPECTIVE

A. MARCUS Nov. 1983 12 p refs Presented at the 1st Ann. Conf. of the Natl. Computer Graphics Assoc., Arlington, Va., 16-19 Jun. 1980

(Contract DE-AC03-76SF-00098)

(DE84-006059; LBL-11076; CONF-8006272-1) Avail: NTIS HC A02/MF A01

Computer-assisted information graphics can benefit by adopting some of the working processes, principles, and areas of concern typical of information-oriented graphic designers. A review of some basic design considerations is followed by a discussion of the creation and design of a prototype nonverbal narrative which combines symbols, charts, maps and diagrams. DOE

N84-22311*# Amoco Production Co., Tulsa, Okla. Research Center.

RIM AS AN IMPLEMENTATION TOOL FOR A DISTRIBUTED HETEROGENEOUS DATABASE

Y. J. BREITBART and L. R. HARTWEG *In* NASA. Langley Research Center IPAD 2: p 155-164 Apr. 1984

Avail: NTIS HC A12/MF A01 CSCL 09B

The another distributed database system (ADDS) prototype supports interactive, d hoc retrieval from several of the Amoco/Standard DHDBMS. The ADDS conceptual design, the usage of RIM in several components of ADDS, and some enhancements of RIM that were used by the developers of the ADDS prototype are outlined. Topics covered include: (1) ADDS Overview; (2) composite database dictionary/directory; (3) user interface and user profiles; (4) subrequest execution; (5) merger/formatter; and (6) a transportable implementation. E.A.K.

N84-22312*# Martin Marietta Aerospace, Denver, Colo.

RIM AS THE DATA BASE MANAGEMENT SYSTEM FOR A MATERIAL PROPERTIES DATA BASE

P. H. KARR and D. J. WILSON *In* NASA. Langley Research Center IPAD 2: p 165-169 Apr. 1984

Avail: NTIS HC A12/MF A01 CSCL 09B

Relational Information Management (RIM) was selected as the data base management system for a prototype engineering materials data base. The data base provides a central repository for engineering material properties data, which facilitates their control. Numerous RIM capabilities are exploited to satisfy prototype data base requirements. Numerical, text, tabular, and graphical data and references are being stored for five material types. Data retrieval will be accomplished both interactively and through a FORTRAN interface. The experience gained in creating and exercising the prototype will be used in specifying requirements for a production system. E.A.K.

N84-22316*# Missouri Univ., Rolla.

THE DATABASE MANAGEMENT SYSTEM: A TOPIC AND A TOOL

O. R. PLUMMER *In* NASA. Langley Research Center IPAD 2: p 229-235 Apr. 1984

Avail: NTIS HC A12/MF A01 CSCL 09B

Data structures and data base management systems are common tools employed to deal with the administrative information of a university. An understanding of these topics is needed by a much wider audience, ranging from those interested in computer aided design and manufacturing to those using microcomputers. These tools are becoming increasingly valuable to academic programs as they develop comprehensive computer support

systems. The wide use of these tools relies upon the relational data model as a foundation. Experience with the use of the IPAD RIM5.0 program is described. E.A.K.

N84-23139*# Maryland Univ., College Park. Dept. of Computer Science.

MONITORING SOFTWARE DEVELOPMENT THROUGH DYNAMIC VARIABLES

C. W. DOERFLINGER and V. R. BASILI /in NASA. Goddard Space Flight Center Proc. of the Eighth Ann. Software Eng. Workshop 32p 30 Nov. 1983 refs (Contract NSG-5123)

Avail: NTIS HC A15/MF A01 CSCL 09B

Research conducted by the Software Engineering Laboratory (SEL) on the use of dynamic variables as a tool to monitor software development is described. Project independent measures which may be used in a management tool for monitoring software development are identified. Several FORTRAN projects with similar profiles are examined. The staff was experienced in developing these types of projects. The projects developed serve similar functions. Because these projects are similar some underlying relationships exist that are invariant between the projects. These relationships, once well defined, may be used to compare the development of different projects to determine whether they are evolving the same way previous projects in this environment evolved.

Author

N84-23150*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

MANAGERS HANDBOOK FOR SOFTWARE DEVELOPMENT

W. AGRESTI, F. MCGARRY, D. CARD, J. PAGE, V. CHURCH, and R. WERKING Apr. 1984 59 p refs

(NASA-TM-85604; SEL-84-001; NAS 1.15:85604) Avail: NTIS HC A04/MF A01 CSCL 09B

Methods and aids for the management of software development projects are presented. The recommendations are based on analyses and experiences with flight dynamics software development. The management aspects of organizing the project, producing a development plan, estimation costs, scheduling, staffing, preparing deliverable documents, using management tools, monitoring the project, conducting reviews, auditing, testing, and certifying are described.

M.A.C.

N84-23294# Air Force Space Div., Los Angeles, Calif.

OFFICE AUTOMATION IN THE ACQUISITION ENVIRONMENT Final Report

J. M. BARRY /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 2-4 1983

(AD-P002747) Avail: NTIS HC A24/MF A01 CSCL 15E

The Defense Meteorological Satellite Program embarked on automating the office functions associated with word processing, data delivery, financial and management information in March, 1981. This paper describes some of the planning, experiences, and lessons learned involved with automating the acquisition environment within the program. This description includes specifying the hardware, software, communications and interfaces involved in tying together not only the program office, but also the contractors, and operating and supporting agencies. Finally, the paper evolves recommendations for future directions in automating the acquisition environment.

Author (GRA)

N84-23295# Air Force Space Div., Los Angeles, Calif.

THE MICROCOMPUTER IN THE ACQUISITION ENVIRONMENT Final Report

M. ECUNG /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 5-11 1983

(AD-P002748) Avail: NTIS HC A24/MF A01 CSCL 15E

Headquarters Space Division in Los Angeles took the initiative in adopting the microcomputer as a viable tool to improve overall operations. After a little better than 18 months there are over 200 terminals on station. Most are split between 4 and 8 user multiprocessor systems. Our primary goal in both microcomputer

hardware and software acquisition is to stay away from proprietary products that can lock the user into a particular vendor for systems support and modification. The result of our November 1981 design decision was hardware configured around the Z80 microprocessor using the S-100 (IEEE-696) Bus. Standardized user interface was included by specifying a keyboard configuration of NASA'S Jet propulsion Laboratory design with 40 programmable function keys. Eight inch single side, single density floppy disk drives (IBM format 3740) were chosen because they represent the one industry wide standard in disk formatting. Though most of this work was done in a Contracting office the conclusions are relevant to all. We feel the experience of our period of experimentation with Office Automation can aid other offices considering taking this course of action. We have had both positive and negative result with our effort, but the overall conclusion is that: (1) micro-computer office automation can not be avoided; and (2) we have only scratched the surface of its applications in the acquisition environment.

Author (GRA)

N84-23296# Army Armament Munitions and Chemical Command, Rock Island, Ill.

PAPERLESS SOLICITATION AND CONTRACTING Final Report

G. T. NICKOLAS /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 12-16 1983

(AD-P002749) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper examines the contract simplification effort currently undergoing prototype development in the services under the Defense Acquisition Improvement Program. This effort has led the author to explore the state of the art of contracting and what changes will have to be made to methods of contracting to keep pace with the commercial marketplace in the next decade. Further, the computer is becoming as common as the telephone in every office. The use of the computer seems to be unlimited, ranging from games to sending electronic mail. This paper provides what the author perceives as a step by step advancement needed by the Government in the use of computers to transition from formal paper contracts transported by mail to paperless contracting transmitted via telephone lines or satellite to contractors and between contractor and Government agencies. This paper explains the author's concept of the various elements of paperless contract evolution which must be achieved to allow the release of solicitations via computers, and the eventual award of contracts via computers.

Author (GRA)

N84-23297# Air Force Systems Command, Wright-Patterson AFB, Ohio.

MECHANIZED CONTRACT DOCUMENT PREPARATION AND ABSTRACT SYSTEM Final Report

T. L. BONO /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 18-22 1983

(AD-P002750) Avail: NTIS HC A24/MF A01 CSCL 15E

We have developed a system that revolutionizes contract document preparation by taking advantage of state-of-the-art technology in combining the functions of word processing (WP) and data processing (DP). This system has been proven effective in reducing document preparation time, in producing a better quality document, and reducing document errors. The system simultaneously captures data to be abstracted and fed into a Management Information System (MIS) ensuring that the contract document and abstracted data in the MIS are identical. Since contract documents are mostly text, the WP capability was most important, yet the abstract of specific information could not be accurately and efficiently captured in WP mode. To streamline the data capture portion of the system for abstracting, DP was needed. Finally, to produce a finished product containing both the text and abstracted data, WP and DP had to be efficiently integrated. Through complex software development, we supplemented the vendor software development, we supplemented the vendor software to build a successful prototype system that is undergoing acceptance testing. The system is still in its infancy, but it has taken great strides in increasing the efficiency of contractual

05 COMPUTERS AND INFORMATION MANAGEMENT

document preparation and abstracting. Yet to come is distributed processing of edit and validation routines currently being accomplished on the mainframe computer. Author (GRA)

N84-23298# Air Force Systems Command, Wright-Patterson AFB, Ohio.

THE ACQUISITION MANAGEMENT INFORMATION SYSTEM: FRIEND OR FOE? Final Report

C. R. COOK *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 23-27 1983

(AD-P002751) Avail: NTIS HC A24/MF A01 CSCL 15E

AFSC's Acquisition Management Information System (AMIS) is a complex, extensive computer system containing detailed information on over 61,000 contracts. This paper describes the history and development of AMIS, plus recent actions taken by the Directorate of Contract Data Systems to improve system user-friendliness. A survey of field activities revealed several unsatisfied user needs, especially in data input/output. The Distributed Processing for Contractual Input (DPCI) system was designed and programmed to fill some of these needs. The genesis and growth of DPCI is treated, including software design and hardware acquisition. The paper also covers a fundamental change in management philosophy--expanded participation of system users in establishing and prioritizing system development and change. A new AMIS Users Group was established to advance the effective use of AMIS through the interchange of information concerning system design, use, operation and maintenance. More emphasis is also being placed on improving data base accuracy and completeness. Management education has been stressed. The paper explains steps taken in these and other areas and comments on future system changes to further enhance user-friendliness.

Author (GRA)

N84-23331# Bedford Research Associates, Mass.

COMPUTER GENERATED ACQUISITION DOCUMENT SYSTEM (CGADS) Final Report

S. F. OSHAUGHNESSY and G. L. ROEDER *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 209-213 1983

(AD-P002784) Avail: NTIS HC A24/MF A01 CSCL 15E

The Computer Generated Acquisition Document System (CGADS) is a computer program written in F77 (version of FORTRAN 77) through which draft Statements of Work (SOW) and Contract Data Requirements Lists (CDRL) for weapon systems acquisitions may be created. CGADS was developed by the Electronics Systems Division at Hanscom Air Force Base, Massachusetts, to provide automated assistance to project/procurement offices in the development of acquisition documentation for inclusion in solicitations and Request for Proposals (RFPs). This paper describes the current version of the operational CGADS.

Author (GRA)

N84-23332# American Inst. for Research, Bedford, Mass.

COMPUTER AIDED SOURCE SELECTION (CASS) Final Report

G. L. ROEDER *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 214-216 1983

(AD-P002785) Avail: NTIS HC A24/MF A01 CSCL 15E

The source selection process in the Department of Defense is a labor intensive effort which ties-up the management, technical, and administrative resources of acquisition agencies on a continuing basis. The CASS series of prototype computer programs have been developed with the objective of providing automated aids to facilitate the conduct and management of the source selection process. It is anticipated that the following benefits can accrue with the use of CASS by the DoD: Shorten the time required for source-selection decisions; Reduce the manpower supporting proposal evaluations for both the Government and Industry; Improve traceability of evaluation findings to contractor selection; Serve as a training aid to new and inexperienced evaluators; Provide more flexible decision support tools; Reduce the

administrative burden of documenting the source-selection; and Facilitate a lessons learned data base. GRA

N84-23370# Defense Systems Management School, Fort Belvoir, Va.

PROGRAM MANAGER'S SUPPORT SYSTEM (PMSS): AN UPDATE Final Report

J. E. COX, T. INGALLS, and H. J. SCHUTT *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 460-466 1983

(AD-P002825) Avail: NTIS HC A24/MF A01 CSCL 05A

The Defense Systems Acquisition Process is a complicated process requiring the integration of many disciplines and functional areas. The Defense Program Manager (PM), in executing an assigned program within this environment, is faced with many non-routine and unstructured decisions. Although Management Information Systems (MIS) typically are available to the PM and provide information to aid in making these decisions, they predominately support only past and current project status, usually with an abundance, and many times perhaps, an over-abundance of data. A need exists, therefore, to support the PMs' decision-making process by looking at future courses of action and distilling the available data into meaningful alternatives. This need is being addressed at the Defense Systems Management College (DSMC) through a research project aimed at applying Decision Support System (DSS) technology to the Defense weapons systems program management environment. This paper describes the resultant Program Manager's Support System (PMSS) effort. It is an update to the PMSS presentation given at the 1982 Federal Acquisition Research Symposium. As such, this paper presents a brief background review, the functional requirements for such a system, the project's current status and future plans, and issues which must be addressed. GRA

N84-23386# Rolls-Royce Ltd., Derby (England).

CORPORATE DP PLANNING: NEW APPROACHES AND NEW CONCERNS

J. H. RUSSEL 12 Jul. 1983 11 p

(PNR-90180; REPRINT-893) Avail: NTIS HC A02/MF A01

Management of data processing systems development in the aircraft industry is discussed. Software development strategies and user requirements are considered. Author (ESA)

N84-23395# Joint Publications Research Service, Arlington, Va. **PREREQUISITES FOR SCIENTIFIC-TECHNICAL PROGRESS ENUMERATED**

A. Y. VARSHAVSKIY *In* its USSR Rept.: Sci. and Technol. Policy (JPRS-UST-84-005) p 1-13 23 Feb. 1984 refs Transl. into ENGLISH from Izv. Akad. Nauk SSSR: Ser. Ekon. (USSR), no. 6, Nov.-Dec. 1983 p 36-46

Avail: NTIS HC A05

The most important trends in scientific and technical development are used as the basis for an examination of problems in the assessment of the scientific and technical potential of national economic sectors and methods of accelerating its growth rate. Author

N84-23396# Joint Publications Research Service, Arlington, Va. **PROBLEMS OF PROMPT ADOPTION OF NEW TECHNOLOGY DISCUSSED**

A. IVAKHNOV *In* its USSR Rept.: Sci. and Technol. Policy (JPRS-UST-84-005) p 28-33 23 Feb. 1984 Transl. into ENGLISH from Izv. (USSR), 6 Dec. 1983 p 2

Avail: NTIS HC A05

The way of solving many economic problems facing the country lies in activation of scientific research, strengthening the tie between science and production and speeding up introduction of the achievements of science and technology into the national economy. Scientists, ministers and personnel of planning organs know this. But time passes and sometimes a tremendous distance exists to the time of introduction of new developments. Why does that happen? Usually, the ministries in question have a ready answer: either the plan was not reinforced with resources, or the

construction people let it down, or subcontractors failed to deliver materials or equipment on time. At the same time, the State Plan for Economic and Social Development of the USSR whose constituent parts consist of scientific-technical programs is the same for all and its fulfillment is the law of our economy. Deputies of the USSR Supreme Soviet--members of the preparatory commission--discussed this quite specifically. Such organs form permanent commissions of the chambers for analysis of materials presented by ministries and departments. Author

N84-23406 Maryland Univ., College Park.
STRATEGIES AND MECHANISMS FOR THE DIFFUSION OF SCIENTIFIC AND TECHNICAL INFORMATION: A COMPARATIVE STUDY Ph.D. Thesis
 Z. M. P. D. S. FRANCA 1983 174 p
 Avail: Univ. Microfilms Order No. DA8402558

Existing strategies and mechanisms for the diffusion of scientific and technical information through an analysis of selected doctoral dissertations are analyzed. The major results of the study were as follows: (1) On the basis of Lewin's three-phase paradigm for planned change, seven types of information strategy were identified: Delivery, Information Network, Adoption-Diffusion, Decision-making, Direct Foreign Investment, Research, Development and Diffusion, and Social Behavioral; (2) A wide variety of mechanisms were noted; (3) Chi-square testing showed that personal mechanisms were significantly more effective than other types of mechanism; (4) A model was constructed which reflected the variation in communication sources and channels as well as the role of social cultural pressures and decision-making functions at all three levels of information dissemination. This model is applied to the communication process between developed nations to end-users in less developed countries. Dissert. Abstr.

N84-24496# RAND Corp., Santa Monica, Calif.
DESIGNING READABLE AND REUSABLE TABLES
 I. S. LOWRY Dec. 1983 84 p refs
 (RAND/P-6945; AD-A145254) Avail: NTIS HC A05/MF A01

A practical guide to designing tables for research reports, books, and professional articles is presented. Expository purposes and devices for achieving them are stressed. The specific applications of tables or figures are outlined. Exemplary tables are provided in the main text along with 50 sample tabular formats in the appendix. A glossary of tabular terms is included. R.S.F.

N84-25329# Naval Postgraduate School, Monterey, Calif.
A GUIDE TO MACRO AND MICRO COMPUTER PERFORMANCE EVALUATION M.S. Thesis
 G. K. GRAY Dec. 1983 125 p
 (AD-A140127) Avail: NTIS HC A06/MF A01 CSCL 09B

Guidelines and discussions are presented for computer performance evaluation at two levels. The first level, Computer Performance Management (CPM) or Macro Performance Evaluation, involves an overall computer performance management strategy concerning the use of computer resources. The role of CPM throughout the computer system life-cycle is also discussed. The second level of computer performance involves Computer Performance Evaluation (CPE) or Micro Performance Evaluation. A brief discussion of CPE tools is given, as well as how to select a performance monitor. Some computer performance fallacies are revealed and a discussion of the determination of 'critical sections' of software systems and program tuning practices for improving system performance is presented. Limited discussion is devoted to performance issues in relatively new areas in the computer field such as networks, data base management systems and microcomputers. Author (GRA)

N84-25331# National Bureau of Standards, Washington, D.C.
 Inst. for Computer Sciences and Technology.
COMPUTER SCIENCE AND TECHNOLOGY: SELECTION OF MICROCOMPUTER SYSTEMS Final Report
 J. BARKLEY, D. GILBERT, and A. HANKINSON Mar. 1984 34 p refs
 (PB84-167725; NBS-SP-500-112; LC-84-601010) Avail: NTIS HC A03/MF A01 CSCL 09B

This document is chiefly aimed at providing assistance to non-technical users in evaluating the applicability of microcomputer-based systems in addressing their needs and choosing appropriate systems. However, technical users providing related support to their organizations should also find the material useful. Similarity, while focused for Federal users of administrative/management applications, there is general applicability to other environments. GRA

N84-25354# Mitre Corp., Bedford, Mass.
SOFTWARE COST ESTIMATION WORKSHOP REPORT Final Report
 H. SCHULTZ Jan. 1984 39 p Workshop held at Bedford, Mass., 13 - 15 Sep. 1983
 (Contract F19628-84-C-0001; AF PROJ. 6810)
 (AD-A139840; MTR-9165; ESD-TR-84-150) Avail: NTIS HC A03/MF A01 CSCL 09B

The Software Cost Estimation (SCE) Workshop was held September 13-15, 1983 at The MITRE Corporation in Bedford, Mass., sponsored by the Electronic Systems Division of the U.S. Air Force and the Rome Air Development Center, Rome, N.Y. Government and industry experts addressed the topics: Cost Effective Software Data Collection on Defense Programs; Integrating SCE with Program Management; Organization and Performance of SCE; and New Directions in SCE. This report contains a summary of each group's discussions and findings, together with a list of recommendations. The views expressed at the workshop and reported in this document are those of the participants and should not be interpreted as official positions of the government agencies, corporate entities, academic institutions or other organizations with which the individual participants are affiliated. GRA

N84-25367# California Univ., Livermore. Lawrence Livermore Lab.
SPECIAL OR GENERAL PURPOSE END-TO-END TRANSPORT MECHANISMS IN DISTRIBUTED SYSTEMS: ONE VIEW
 R. W. WATSON and S. MAMRAK (Ohio State Univ.) Feb. 1984 13 p refs Presented at the 4th Intern. Conf. on Distributed Computing Systems, San Francisco, 14-18 May 1984
 (Contract W-7405-ENG-48)
 (DE84-008297; UCRL-89755; CONF-8405126-1) Avail: NTIS HC A02/MF A01

There is increasing interest in the design of special purpose end to end transport mechanisms for use in distributed systems. The special purpose designs try to minimize the mechanisms needed to match the error and other service properties of specific networks with the services required by application and communication interface semantics. General-purpose transport protocol designs and implementations can be effective in a wide range of distributed applications because: (1) many of the mechanisms and implementation techniques used in the special purpose work apply to general purpose transport protocol designs and implementations; (2) special purpose designs have hidden costs; and (3) quite special overall system loads, application response times, and interaction patterns are required before general purpose protocols are the main performance bottlenecks. M.A.C.

05 COMPUTERS AND INFORMATION MANAGEMENT

N84-25512# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
SIRIUS: BIBLIOGRAPHIC SEARCH AND RETRIEVAL SYSTEM [SIRIUS: SISTEMA DE PESQUISA E RECUPERACAO BIBLIOGRAFICA]

E. F. DOOFILHO, U. M. DEFREITAS, V. L. SIQUEIRA, C. R. T. DASILVA, M. L. RIBEIRO, and H. O. DEC.R.ALVES Jun. 1983 19 p refs In PORTUGUESE; ENGLISH summary Presented at the 20th Brazilian Congr. of Library Sci. and Documentation, Balneario Camboriu, Brazil, 23-28 Oct. 1983

(INPE-2771-PRE/344) Avail: NTIS HC A02/MF A01

An on-line system developed and implemented at INPE may be accessed to obtain bibliographic data through the arguments such as author, title, descriptor and series; as well as to obtain up-dated circulation information about a certain material and/or user. The query language is constructed of the following commands: MOSTRE: lists the arguments with the same radical; DEFINA: creates and combines sets of references; VERIFIQUE: lists and/or removes references of a set; IMPRIMA: prints a set; NOMES: furnishes the relation of the defined sets; USUARIO: states the present situation of a user in relation to loads and reservations; MATERIAL: informs the availability of some material for load; SOS: helps the user to handle the query language. This bibliographic retrieval system that was developed for the B 6800 Burroughs can be adapted to other computers. Author

N84-25522# California Univ., Berkeley. Lawrence Berkeley Lab.

PROCEEDINGS OF THE 2ND INTERNATIONAL WORKSHOP ON STATISTICAL DATABASE MANAGEMENT

R. HAMMOND and J. L. MCCARTHY 1983 431 p refs Workshop held at Los Altos, Calif., 27-29 Sep. 1983

(Contract DE-AC03-76SF-00098)

(DE84-005866; LBL-16321; CONF-830950) Avail: NTIS HC A19/MF A01

The purpose of this workshop is to bring together statisticians and computer scientists, statistical database system users and system builders, to exchange ideas on statistical data base management, statistical analysis, and the present recognized problems that current data management and statistical software do not fully address. The proceedings are published prior to the Workshop so that they can: (1) report research results and work in progress; (2) provide an intellectual introduction to most of the workshop participants; (3) provide a point of departure for working group discussions. DOE

N84-25742# Range Commanders Council, White Sands Missile Range, N. Mex. Documentation Group.

UNIVERSAL DOCUMENTATION SYSTEM HANDBOOK - AN INTRODUCTION TO THE UNIVERSAL DOCUMENTATION SYSTEM

1984 16 p

(AD-A140140; RCC/DG-501-84) Avail: NTIS HC A02/MF A01 CSCL 05A

The Range Commanders Council (RCC) Documentation Group has developed a Universal Documentation System (UDS) for the purpose of creating better communications between interacting agencies. The UDS endeavors to standardize the efforts of all agencies who seek support in conducting operations on the various ranges. The following graphic illustrations have been prepared for the purpose of familiarizing potential range users with the UDS, which has been published as RCC Document 401. An overview of the system, including descriptions of the various levels of documentation, system flexibility/options and general user guidelines has been included. The UDS is a comprehensive tool which can be used by all. Author (GRA)

N84-26317*# Mitre Corp., McLean, Va.

GUIDELINES FOR DEVELOPING NASA (NATIONAL AERONAUTICS AND SPACE ADMINISTRATION) ADP SECURITY RISK MANAGEMENT PLANS Final Report

F. G. TOMPKINS Aug. 1983 60 p refs

(Contract NASW-3425)

(NASA-CR-173564; NAS 1.26:173564; PB84-171321;

MTR-83W123) Avail: NTIS HC A04/MF A01 CSCL 09B

This report presents guidance to NASA Computer security officials for developing ADP security risk management plans. The six components of the risk management process are identified and discussed. Guidance is presented on how to manage security risks that have been identified during a risk analysis performed at a data processing facility or during the security evaluation of an application system. GRA

N84-26318*# Mitre Corp., McLean, Va.

GUIDELINES FOR DEVELOPMENT OF NASA (NATIONAL AERONAUTICS AND SPACE ADMINISTRATION) COMPUTER SECURITY TRAINING PROGRAMS Final Report

F. G. TOMPKINS May 1983 50 p refs

(Contract NASW-3425)

(NASA-CR-173562; NAS 1.26:173562; PB84-171339;

MTR-83W68) Avail: NTIS HC A03/MF A01 CSCL 09B

The report presents guidance for the NASA Computer Security Program Manager and the NASA Center Computer Security Officials as they develop training requirements and implement computer security training programs. NASA audiences are categorized based on the computer security knowledge required to accomplish identified job functions. Training requirements, in terms of training subject areas, are presented for both computer security program management personnel and computer resource providers and users. Sources of computer security training are identified. Author (GRA)

N84-26471# Clemson Univ., S.C.

UNIFIED DATABASE DEVELOPMENT PROGRAM Final Report

E. L. THOMAS, JR. and R. N. DEEM Brooks AFB, Tex. Air Force Human Resources Lab. Mar. 1984 110 p

(Contract F33615-79-C-0027; AF PROJ. 1710)

(AD-A140309; AFHRL-TR-83-52) Avail: NTIS HC A06/MF A01 CSCL 15E

The objective of the unified database (UDB) program was to develop an automated system that would be useful to those responsible for the design, development, testing, and support a new Air Force aircraft weapon system. Primary emphasis was on development of an historical logistics data repository system to provide convenient and timely access to relevant information about existing aircraft weapon systems, development of a fully automated logistics support analysis record system that would satisfy current Air Force and Department of Defense requirements, and develop the overall UDB system to function as a closed-loop system for use throughout the life of a weapon system. This report summarizes the accomplishments of the UDB program to data and describes the major features and capabilities of the UDB system. GRA

N84-26473# Rochester Univ., N. Y. Dept. of Computer Science.

THE ROE FILE SYSTEM

C. S. ELLIS and R. A. FLOYD Mar. 1983 20 p

(Contract N00014-82-K-0193; NSF IST-80-25761; NSF

MCS-81-04008)

(AD-A140497; TR-119) Avail: NTIS HC A02/MF A01 CSCL 09B

ROE is a network-wide file system being developed for a heterogeneous local network. The system has been designed for two purposes: to serve as a testbed for experimenting with various policies for file migration and distribution strategies and to provide users with a logically coherent file system that takes advantage of distributed and diverse resources. The system is a synthesis of solutions to the problems of ensuring consistency of replicated data, allowing transparent reconfiguration, and providing adequate file accessibility. This report describes what has been accomplished

so far in the ROE project. We outline the assumed environment, the basic structure of ROE, and the functions provided. Mechanisms are presented that allow migration, replication of file objects, and replication of access information to work together. Finally, the state of the implementation to date is described. Author (GRA)

N84-27456# SoHaR, Inc., Los Angeles, Calif.
MICROCOMPUTERS: INTRODUCTION TO FEATURES AND USES Final Report

M. HECHT, H. HECHT, and L. PRESS Mar. 1984 148 p refs
 (Contract NB82SB-C-A1654)
 (PB84-178821; NBS-SP-500-110; LC-84-601005) Avail: NTIS
 HC A07/MF A01 CSCL 09B

Microcomputers and their uses in the Federal government are examined. Basic concepts in microcomputers are discussed, and their uses by clerical, administrative, professional, and technical Federal personnel are described. The motivations costs, and risks of microcomputer use are identified, and recommendations for successful implementations are provided. Appendices contain a glossary and annotated bibliography. GRA

N84-27457 State Univ. of New York, Stony Brook.
THE IMPACT OF COMMUNICATING THROUGH COMPUTERS
Ph.D. Thesis

S. L. MURREL 1983 159 p
 Avail: Univ. Microfilms Order No. DA8405379

The impact of two synchronous approaches is examined which vary in the role of immediacy of interaction and feedback, on idea generation and group decision making. One system is message oriented, requiring a conferee to complete a message before interacting with others. The other displays what each group member is typing in a separate window on the screens of all participants so that users can comment on ideas as they are expressed. While the differential ability to interact did not influence brainstorming performance, it did influence the ability of groups to produce quality decisions. Groups interacting through either of the communication systems generated fewer ideas than the same number of people working individually on three of those problems. Window system groups both improved more and produced significantly higher quality decisions than message system groups. Dissert. Abstr.

N84-27472# Naval Postgraduate School, Monterey, Calif.
PROJMNG FORTRAN: AN INTERACTIVE COMPUTER PROGRAM FOR USE WITH THE DEFENSE MANAGEMENT SIMULATION EXERCISE M.S. Thesis

G. W. SCHULTZ Mar. 1984 324 p
 (AD-A140709) Avail: NTIS HC A14/MF A01 CSCL 09B

Contact Negotiation Package (CNP), the supporting computer program for the Defense Management Simulation, is revised and embedded into a program which makes it user-friendly, and which provides sensitivity analysis capability to it. The program includes a plotting function for the sensitivity analysis. Exercise records are established for review of contracting team performance. Database files are generated which permit teams to submit reports, which provide a baseline for subsequent game sessions, and which permit monitor evaluation of team progress. The text provides a description for the operation of both CNP and PROJMNG. It documents the new program, PROJMNG. Appendices include the FORTRAN code, and Conversational Monitor System executive machine language programs for the new programs operation. It contains instruction manuals which depict operation for both programs. Author (GRA)

N84-27482# National Aerospace Lab., Amsterdam (Netherlands). Informatics Div.

A DATA MANAGEMENT AND PRESENTATION TOOL FOR ENGINEERING AND RESEARCH

F. J. HEEREMA and H. A. KREIJKAMP 19 Aug. 1983 14 p refs
 Presented at the 36th European Control Data Users (ECODU) Conf., Dusseldorf, 12-16 Sep. 1983
 (NLR-MP-83044-U) Avail: NTIS HC A02/MF A01

An engineering data management system based on computer aided design techniques was designed and made operational.

Database management techniques cope with data transfer. Interactive interrogating of a centralized database, and interactive graphics are applied in the analysis and presentation functions. The system is called the Engineering Data Interactive Presentation and Analysis System. Author (ESA)

N84-27491# National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.

COMPARING SOFTWARE DEVELOPMENT METHODOLOGIES FOR ADA (TRADE NAME): A STUDY PLAN Final Report

P. FREEMAN, A. I. WASSERMAN (California Univ., Irvine), and R. C. HOUGHTON, JR., ed. Mar. 1984 38 p
 (PB84-178029; NBSIR-84-2827) Avail: NTIS HC A03/MF A01 CSCL 09B

A study plan is presented that concentrates on the impact of alternative development methodologies on the maintainability of Ada code. The basic elements of the study include: (1) experts in each of several methods create Ada implementation for a specific problem, (2) each implementation is modified by each of several maintenance terms, and (3) the impact of the methodology on the maintainability of the resulting Ada coded systems is evaluated and reported. GRA

N84-28666# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

EVALUATION OF AUTOMATED CONFIGURATION MANAGEMENT TOOLS IN ADA PROGRAMMING SUPPORT ENVIRONMENTS M.S. Thesis

M. S. ORNDORFF Mar. 1984 135 p
 (AD-A140982; AFIT/GCS/EE/84M-1) Avail: NTIS HC A07/MF A01 CSCL 05A

This investigation studied the task of configuration management of computer software systems. First, a detailed definition of configuration management from the perspectives of project management and project engineers was developed. This definition was used to conduct a requirements analysis of the support required in automated programming environments for the configuration management task. Based on these requirements, evaluation criteria were developed that were appropriate for the evaluation of configuration management tools designed to satisfy the 1980 Stoneman requirements document. These evaluation criteria were used to evaluate the November 1983 release of the Army's Ada Language System. The requirements and evaluation criteria developed in this thesis are designed to provide designers and purchasers of Ada Programming Support Environments (APSE) with the tools necessary to determine the effectiveness of an APSE implementation in supporting the task of configuration management of large software projects developed for embedded computer systems. Author (GRA)

N84-28670# Naval Postgraduate School, Monterey, Calif.
OFFICE AUTOMATION: A LOOK BEYOND WORD PROCESSING
M.S. Thesis

M. E. DUBOIS, JR. Jun. 1983 135 p refs
 (AD-A132764) Avail: NTIS HC A07/MF A01 CSCL 15E

A capsulated examination of what office automation is, what it consists of, what applications are available, and how it can be implemented is presented. The problems of implementing an automated office and the possible impact it can have on human office workers are also addressed. Word processing was the first of various forms of office automation technologies to gain widespread acceptance and usability in the business world. For many, it remains the only form of office automation technology. Office automation, however, is not just word processing, although it does include the function of facilitating and manipulating text. In reality, office automation is not one innovation, or one office system, or one technology, but rather it is the integration of a broad set of office system, information processing and communications technologies. Office automation encompasses a wide span of applications which are examined individually as well as collectively. GRA

05 COMPUTERS AND INFORMATION MANAGEMENT

N84-28672# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. Dept. of Computer Science.

APPLICATIONS PROGRAMS TO FACILITATE USE OF A DBMS TO STORE AND RETRIEVE GRAPHICS DISPLAYS (INGRED 2) M.S. Thesis

J. D. GATEWOOD Dec. 1983 240 p refs
(AD-A138059; AFIT/GCS/EE/83D-10) Avail: NTIS HC A11/MF A01 CSCL 09B

Applications programs are written to facilitate the use of the RIM relational Data Base Management System DBMS to store and retrieve graphics displays generated using capabilities of a graphics editor. This DBMS storage capability is in addition to data file storage provided by INGRED, the graphics editor. The resulting system is called INGRED II. The addition of DBMS capabilities makes the graphics editor much more flexible and more user friendly. It results in the capabilities to obtain a listing of displays stored in the data base, to delete displays from storage which are no longer needed, and to store pertinent information in the data base along with the display data. Author

N84-28673# Alexander Systems Co., San Diego, Calif.
MITs II (MICROFICHE IMAGE TRANSMISSION SYSTEM) INVESTIGATIONS AND DESIGN ALTERNATIVES Final Report, Aug. - Dec. 1983

D. L. ENDICOTT, JR. Mar. 1984 161 p
(Contract N66001-83-G-0294)
(AD-A141040; NOSC-CR-229) Avail: NTIS HC A08/MF A01 CSCL 14E

A design study was conducted to investigate optional methods for the design and fabrication of a production version of the Microfiche Image Transmission System (MITs II). This second-generation facsimile is intended for high volume electronic transmission of microfiche personnel records from the Naval Military Personnel Command to major Navy facilities around the world. Major tasks in this design study include: evaluation of alternative design approaches for improving the performance and reliability of the prototype MITs configuration (MITs I); identification of commercially available components, systems, or related technologies which potentially satisfy MITs II functional requirements; and preparation of a System Design Description which documents the results. Significant findings of this study include: a new concept for a whole fiche scanner which requires a minimum on complexity in the film transport; a minicomputer/microcomputer architecture for control and processing of image data and record request activity respectively; incorporation of a high performance microfiche stack loader and bar code label identification; a customized satellite telecommunications interface to optimize data transmission performance; a commercially available laser computer output microfilm (COM) recorder which uses dry-processed silver halide film; a recommendation to not implement multi-grey level scanning or recording for reasons of system throughput and hardware availability; and selection of PASCAL as the most appropriate high order language for all custom system software. GRA

N84-29495# California Univ., Berkeley. Dept. of Electrical Engineering and Computer.

DESIGN AND PERFORMANCE OF A DISTRIBUTED RELATIONAL DATA BASE SYSTEM Technical Report, 15 Nov. 1981 - 30 Sep. 1983

R. S. FABRY and C. SEQUIN 30 Sep. 1983 172 p
(Contract N00039-82-C-0235; ARPA ORDER 4031)
(AD-A142177) Avail: NTIS HC A08/MF A01 CSCL 09B

This paper briefly presents the design of a distributed relational data base system. Then, the authors discuss experimental observations of the performance of that system executing both short and long commands. Conclusions are also drawn concerning metrics that distribute query processing heuristics should attempt to minimize. Lastly, they comment on architectures which appear viable for distributed data base applications. Author (GRA)

N84-29786# Booz-Allen and Hamilton, Inc., Bedford, Mass.
LONEX (LABORATORY OFFICE NETWORK EXPERIMENT) COST/BENEFITS STUDY, VOLUME 1 Final Technical Report
Griffiss AFB, N.Y. RADC Apr. 1984 73 p 2 Vol.
(Contract F19628-78-C-0163; AF PROJ. 9993)
(AD-A141396; RADC-TR-84-62-VOL-1) Avail: NTIS HC A04/MF A01 CSCL 05A

This report documents the results of an analysis of costs and benefits which are expected to accrue to the Rome Air Development Center (RADC) through the acquisition and implementation of an organizational office automation system. The report has two major parts: (1) Volume 1 - the LONEX Cost/benefits Study which describes the major findings and (2) Volume 2 - Appendix 3, Cost Benefits Analysis - A comparative cost analysis is presented in accordance with AFSC regulations and guidelines. The ground rules and assumptions underlying the analysis are detailed and comparisons are made using constant, inflated and discounted dollars for three cases: (1) present (no automation), (2) lease and (3) purchase. Author (GRA)

N84-29787# Booz-Allen and Hamilton, Inc., Bedford, Mass.
LONEX (LABORATORY OFFICE NETWORK EXPERIMENT) COST/BENEFITS STUDY, VOLUME 2 Final Technical Report
Griffiss AFB, N.Y. RADC Apr. 1984 94 p 2 Vol.
(Contract F19628-78-C-0163; AF PROJ. 9993)
(AD-A141397; RADC-TR-84-62-VOL-2) Avail: NTIS HC A05/MF A01 CSCL 05A

The forecasts costs and benefits which will accrued through the implementation of a center-wide office automation system are detailed. The format is based on guidance contained in the Air Force Systems Command Manual 173-1, cost estimating procedures, and in Air Force Regulation 178-1, Economic Analysis and Program Evaluation. Author

N84-29798# Logistics Management Inst., Washington, D. C.
LOCAL AUTOMATION MODEL: SYSTEM SPECIFICATION
W. P. HAMILTON, III, R. W. HARTT, and D. J. OCONNOR Mar. 1984 135 p
(Contract MDA903-81-C-0166)
(AD-A141503; LMI-DL401) Avail: NTIS HC A07/MF A01 CSCL 05B

This document contains a system specification for the Local Automation Model (LAM). The LAM will provide DoD Technical Libraries in the Shared Bibliographic Input Network a local automated information system to improve the management of DoD bibliographic information. The proposed system will replace the existing manual and batch procedures by technical library personnel. The system will provide automated storage of local bibliographic files and access to both local files and the DTIC Technical Reports Data base. Contained in this system specification are a summary of the system characteristics and requirements, a description of the system operating environment (including equipment, software, interfaces, and security) and a discussion of the design details (including general operating procedures, system logic flow, system data, and program descriptions). Author (GRA)

N84-29799# Defense Technical Information Center, Alexandria, Va.

FORMAT REQUIREMENTS FOR SCIENTIFIC AND TECHNICAL REPORTS PREPARED BY OR FOR THE DEPARTMENT OF DEFENSE

7 Nov. 1983 38 p Supersedes MIL-STD-847A dated 31 Jan. 1973
(AD-A141758; MIL-STD-847B; MIS-STD-847A) Avail: NTIS HC A03/MF A01 CSCL 05A

This standard establishes format requirements for scientific and technical reports, including the DD form 1473, Report Documentation Page, prepared by or for the Departments and Agencies of the Department of Defense. Its provisions are mandatory for in-house, contractor, or grantee reports according to the Defense Directives and Instructions. Its purpose is to aid the dissemination and secondary distribution of reports; to reduce

the costs of preparing, storing, retrieving, reproducing, and distribution of reports; and to aid the interchanged of scientific and technical information with the research and development community. Author (GRA)

N84-29802# General Electric Co., St. Petersburg, Fla. Neutron Devices Dept.
SUCCESS WITH DATA MANAGEMENT 4 AT THE DOE PINELLAS PLANT
 M. A. DENTY 1983 13 p Presented at the Honeywell Large Systems Users Assoc. Forum 37, San Diego, Calif., 16 Oct. 1983 (Contract DE-AC04-76DP-00656)
 (DE84-008021; GEPP-OP-754A; CONF-8310260-1) Avail: NTIS HC A02/MF A01

The data management design and implementation approach used on-line systems are described. One system supports purchasing and general stockroom; the other supports engineering product configuration definition and engineering drawing distribution control. Data base administration practices, transaction processing considerations, and data base design techniques, as well as the applications themselves. Problems solved and pitfalls avoided.

DOE

N84-30736# System Development Corp., McLean, Va.
GUIDELINE FOR COMPUTER SECURITY CERTIFICATION AND ACCREDITATION. CATEGORY: ADP (AUTOMATIC DATA PROCESSING) OPERATIONS. SUBCATEGORY: COMPUTER SECURITY. FEDERAL INFORMATION PROCESSING STANDARDS Final Report, Jan. 1981 - Sep. 1982

W. NEUGENT and Z. G. RUTHBERG 27 Sep. 1983 94 p refs
 (FIPS-PUB-102) Avail: NTIS HC A05/MF A01; also available in three ring binder, North American Continent price \$6.25; all others write for quote CSCI 09B

This guideline is intended for use by ADP managers and technical staff in establishing and carrying out a program and a technical process for computer security certification and accreditation of sensitive computer applications. It identifies and describes the steps involved in performing computer security certification and accreditation; it identifies and discusses important issues in managing a computer security certification and accreditation program; it identifies and describes the principal functional roles needed within an organization to carry out such a program; and it contains sample outlines of an Application Certification Plan and a Security Evaluation Report as well as a sample Accreditation Statement and sensitivity classification scheme. GRA

N84-30737*# Mitre Corp., McLean, Va. Metrek Div.
GUIDELINES FOR CONTINGENCY PLANNING NASA (NATIONAL AERONAUTICS AND SPACE ADMINISTRATION) ADP SECURITY RISK REDUCTION DECISION STUDIES Final Report

F. G. TOMPKINS Jan. 1984 64 p refs
 (Contract NASW-3425)
 (PB84-189836; MTR-83W203) Avail: NTIS HC A04/MF A01 CSCI 09B

Guidance is presented to NASA Computer Security Officials for determining the acceptability or unacceptability of ADP security risks based on the technical, operational and economic feasibility of potential safeguards. The risk management process is reviewed as a specialized application of the systems approach to problem solving and information systems analysis and design. Reporting the results of the risk reduction analysis to management is considered. Report formats for the risk reduction study are provided. GRA

N84-30740# National Bureau of Standards, Washington, D.C. Systems and Software Technology Div.

COMPUTER SCIENCE AND TECHNOLOGY: INTRODUCTION TO SOFTWARE PACKAGES Final Report

S. FRANKEL, ed. Apr. 1984 59 p refs
 (NBS-SP-500-114; LC-84-601045) Avail: SOD HC

An introduction to applications software packages is presented. Application areas which are currently supported by software packages are reviewed and the benefits of software package use versus in house development are discussed. An annotated list of publications is provided which may be useful to potential users of software packages in searching for a package to perform a specific application, and in critically evaluation the merits of different packages. M.A.C.

N84-30748# Softech, Inc., Waltham, Mass.
CONFIGURATION MANAGEMENT WITH THE ADA (TRADEMARK) LANGUAGE

R. M. THALL In Army Communications-Electronics Command Proc. of the 2nd Ann. Conf. on Ada (Trademark) Technol. p 11-24 system Mar. 1984
 (Contract DAAK80-80-C-0507)

(AD-P003416) Avail: NTIS HC A07/MF A01 CSCI 09B

Three characteristics of large software projects and five basic configuration management capabilities are identified. The design of the Ada Language System (ALS) is then described in terms of these basic capabilities. The ALS is a computer programming support environment for Ada. Author (GRA)

N84-31041# Pacific Northwest Lab., Richland, Wash.
DEVELOPMENT OF A DOCUMENT PREPARATION STAFF WITHIN AN OFFICE AUTOMATION ENVIRONMENT

J. L. BEBEE Feb. 1984 14 p Presented at the 1984 Office Systems Res. Conf., Los Angeles, 18-19 Feb. 1984
 (Contract DE-AC06-76RL-01830)
 (DE84-008649; PNL-SA-12058; CONF-840276-1) Avail: NTIS HC A02/MF A01

The development of a document preparation staff in an office automation environment is discussed. Office automation will undoubtedly create job match challenges that management cannot ignore. To insure the successful implementation of office automation, management should develop job descriptions, build around the experience staff, select staff by thorough evaluation, integrate new staff into the organization, provide planned staff growth and development, and have an ongoing staff development review process. DOE

N84-31054# Sandia Labs., Albuquerque, N. Mex.
DBMS CONVERSION CASE STUDY

B. C. DALE 1984 14 p Presented at the 2nd Ann. DPMA Software Maintenance Symp., Washington, D.C., 7 May 1984
 (Contract DE-AC04-76DP-00789)
 (DE84-011205; SAND-84-0581C; CONF-8405148-1) Avail: NTIS HC A02/MF A01

The Integrated Procurement System (IPS) is a very large data base application that supports purchasing, accounts payable and cost accounting for materials and services. A redevelopment effort was launched to design and program a new Integrated Procurement System which would incorporate several features not available in the old version, including the capability to account for line item details on purchase orders and to perform our receiving function in an automated fashion rather than manually. All data input via screen programs is desired, i.e., terminal input rather than keypunch and batched. The development of this conversion is described. DOE

05 COMPUTERS AND INFORMATION MANAGEMENT

N84-31056# National Center for Appropriate Technology, Butte, Mont.

APPROPRIATE TECHNOLOGY MANAGEMENT INFORMATION SYSTEM

Feb. 1984 763 p

(Contract DE-AC01-82CE-15095)

(DE84-010952; DOE/CE-15095/14) Avail: NTIS HC A99/MF A01

Grants were given in the full range of technology areas which included conservation, solar, biomass, wind, geothermal, and hydro power. The final report from each DOE grantee was reviewed to extract information about new ideas and proven concepts that could be of value to the public. The appropriate technology management information system (ATMIS), a computer data base, was developed to manage the growing wealth of information from the grant reports, and to monitor the report review process. The ATMIS classifies data into numerous categories (technology area, geographic location, project status, etc.). This manual which was generated directly from the data base is presented. DOE

N84-31059# Max-Planck-Inst. fuer Aeronomie, Katlenburg-Lindau (West Germany).

THE OPTICAL COINCIDENCE INFORMATION RETRIEVAL SYSTEM (OCIR)

G. K. HARTMANN 1984 14 p refs Presented at Intern. Cooperation (ICC) Intern., Zurich, Apr. 1984

(MPAE-L-66-84-10) Avail: NTIS HC A02/MF A01

The Optical Coincidence Information Retrieval System (OCIR), based on an inverted thesaurus (going from specific to general terms in an unhierarchical manner) is described. The hardware in its first stage is based upon a (mechanical) Optical Coincidence Card System which can be implemented in any nonindustrialized country. In its second stage it is implemented on a personal computer. In a third stage it can be supplemented by large computers having free text search capabilities. The OCIR concept allows the generation of many fairly small decentralized and autonomous information systems which might be linked through or into an information center. Author (ESA)

N84-31112*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

SOFTWARE CONTROL AND SYSTEM CONFIGURATION MANAGEMENT: A SYSTEMS-WIDE APPROACH

K. L. PETERSEN and C. FLORES, JR. Aug. 1984 21 p refs Presented at IEEE/AIAA 5th Digital Avionics Systems Conf., Seattle, 31 Oct. - 3 Nov. 1983 Previously announced in IAA as A84-26713 Prepared in cooperation with NASA. Ames Research Center, Moffett Field, Calif.

(NASA-TM-85908; H-1256; NAS 1.15:85908) Avail: NTIS HC A02/MF A01 CSCL 01C

A comprehensive software control and system configuration management process for flight-critical digital control systems of advanced aircraft has been developed and refined to insure efficient flight system development and safe flight operations. Because of the highly complex interactions among the hardware, software, and system elements of state-of-the-art digital flight control system designs, a systems-wide approach to configuration control and management has been used. Specific procedures are implemented to govern discrepancy reporting and reconciliation, software and hardware change control, systems verification and validation testing, and formal documentation requirements. An active and knowledgeable configuration control board reviews and approves all flight system configuration modifications and revalidation tests. This flexible process has proved effective during the development and flight testing of several research aircraft and remotely piloted research vehicles with digital flight control systems that ranged from relatively simple to highly complex, integrated mechanizations. Author

N84-31122# Softech, Inc., Waltham, Mass.

THE EVOLUTION OF THE JOVIAL/J73 LANGUAGE FROM DEFINITION TO USE

J. T. PEPE In ASD Proc. Papers of the 2nd AFSC Avionics Standardization Conf., Vol. 1 p 3-9 Nov. 1982

(AD-P003518) Avail: NTIS HC A25/MF A01 CSCL 09B

The development of a standard programming language is a multi-year effort involving many phases of activity starting with language requirements analysis, leading to language definition, production compilers and programming utilities, and then configuration management of the support software and documentation. After a study of the requirements for a standard Air Force high order language, the JOVIAL/J73 language was defined by MIL-STD-1589A (later superseded by MIL-STD-1589B). Several years of compiler development has resulted in JOVIAL/J73 compilers hosted on three mainframe computers and targeted to several embedded architectures. Because of an embedded computer's limited resources considerable effort has been devoted to compiled object code optimization. The Air Force has sponsored the development of the JOVIAL Compiler Validation System for validating JOVIAL compilers and JOVIAL programming utilities to assist programmers in writing and debugging JOVIAL code. The Language Control Facility has been established to control the definition of JOVIAL/J73, validate compilers and provide support for JOVIAL programmers. Author (GRA)

N84-31179# Federal Electric Corp., Vandenberg AFB, Calif.

AN INTEGRATED APPROACH TO A SUCCESSFUL EMBEDDED COMPUTER RESOURCE PROJECT

L. G. EGAN, JR. In ASD Proc. Papers of the 2nd AFSC Avionics Std. Conf., Vol. 2 p 777-812 Nov. 1982 Proc. held in Dayton, Ohio, 30 Nov. - 2 Dec. 1982

(AD-P003574) Avail: NTIS HC A25/MF A01 CSCL 09B

This paper describes a number of key milestones and techniques that should be accomplished in order to produce cost effective, embedded computing systems. It stresses the necessity of improved project management to effect an integrated hardware/software system. Improved project management requires a thorough understanding and implementation of the DOD/MIL standards and specifications. If Program Project Managers from both the government and contractor are knowledgeable in, and motivated to follow, the approved standards/ specifications, embedded computer resources, i.e., equipment, computer programs, personnel, facilities, and logistics, will be provisioned at lower costs and per the requirements allocated to each resource. The paper will emphasize the need for systems engineering, work breakdown structures, the systems development process, documentation milestones, DT&E for hardware/software, and integration leading to system stones, DT&E for hardware/software, and integration leading to system certification. This can only be effective via standards compliance. Author (GRA)

N84-31196# Department of the Air Force, Washington, D.C.

COST/SCHEDULE MANAGEMENT FOR SOFTWARE DEVELOPMENT

H. WENDT and M. W. EVANS In ASD Proc. Papers of the 2nd AFSC Avionics Std. Conf., Vol. 2 p 1053-1069 Nov. 1982 Proc. held in Dayton, Ohio, 30 Nov. - 2 Dec. 1982

(AD-P003591) Avail: NTIS HC A25/MF A01 CSCL 05A

The importance of good cost/schedule analysis in the Program Management environment is taken for granted. Methods and procedures for WBS have been structured, taught, and generally are accepted as good management techniques. In a hardware environment, this WBS structure is applied to a proposed design or prototype. The basic hardware elements and interfaces are known; cost schedule estimates can be applied to the specific design elements. Software programs do not have a structure or design at contract award. A preliminary design compatible with current WBS criteria is not available until PDR. The pre-PDR software development is comparable to hardware R & D; what design does exist is based on a supposed prototype or model and not a suitable basis for cost/schedule forecasts. This paper discusses the need for a well planned software WBS and the

numerous management and technical factors which must be planned for and developed to insure the WBS adequately represents the program and provides the needed controls.

Author (GRA)

N84-31197# Department of the Air Force, Washington, D.C.
SOFTWARE CONFIGURATION MANAGEMENT IN A PROJECT ENVIRONMENT

H. WENDT and M. W. EVANS *In* ASD Proc. Papers of the 2nd AFSC Avionics Std. Conf., Vol. 2 p 1071-1082 Nov. 1982 Proc. held in Dayton, Ohio, 30 Nov. - 2 Dec. 1982 (AD-P003592) Avail: NTIS HC A25/MF A01 CSCL 05A

The smooth transition of responsibility and flow of work and data within the software project is a prerequisite to project success and development productivity. Establishing a structure characterized by effective data management and control practices is the responsibility of the software manager and requires careful planning, an understanding of the specific data requirements each of the methodologies applied to the project, and definition of the data flow and reviews, audits, and milestones which support the development process. This paper describes how in a project environment data management is integrated under the software configuration discipline and how the program support library concept may be used to centralize data control responsibility within the organization.

Author (GRA)

N84-31494# Naval Postgraduate School, Monterey, Calif.
ANALYSIS OF MODERN ANALOG AND DIGITAL COMMUNICATION CHANNELS FROM A MANAGER'S PERSPECTIVE M.S. Thesis

J. A. BROUSE, JR. Mar. 1984 184 p (AD-A143161) Avail: NTIS HC A09/MF A01 CSCL 17B

This thesis presents the fundamental communication transmission principles which define the performance characteristics of the transmission channel. The subject matter is divided into three categories (1) antennas, (2) transmission lines, and (3) waveguides. The scope of the presentation is results oriented rather than the traditional theorem and proof approach. While the results are quantitative in nature, consideration of the underlying principles as well as the advantages and disadvantages associated with each transmission channel are presented. Although technical factors are often the basis upon which decisions regarding communication systems are made, it is evident that the telecommunication systems manager must understand the fundamental principles of the transmission channel in order to effect viable solutions to telecommunications management problems.

Author (GRA)

N84-32253# Singer Co., Binghamton, N.Y. Link Flight Simulation Div.

DATA BASE MANAGEMENT OF SOFTWARE DEVELOPMENT

R. L. SCHWING *In* American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 295-299 16 Nov. 1983 (AD-P003486) Avail: NTIS HC A17/MF A01 CSCL 09B

The incessant increase in computational power provided by microelectronics has not begun to be matched by corresponding improvements in software productivity. This now trite observation has especially pernicious implications in the Weapon/Mission simulator field, where massive developments of demanding, new, real-time software in relatively short time spans are a way of life. This paper describes a new, comprehensive approach to satisfy this need: a software development environment which relates the total set of information relevant to the software product through data base management techniques. The main elements of the concept include: (1) Organization of the simulator (software and hardware) into a hierarchical framework, clearly separating functions so that top-down design and modularization will be substantially easier, (2) Arrangement of all types of product information - from specifications, through requirements and designs, to code itself - in an engineering data base patterned exactly upon the hierarchical framework in 1 above, (3) Merging of management status information and configuration control data into

the same framework, (4) Provision of a coherent set of tools to connect all elements of the data base for development, control, and management purposes.

GRA

N84-32255# AAI Corp., Cockeysville, Md.
SOFTWARE PROGRESS TRACKING SYSTEM

T. M. MORIARTY *In* American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 305-311 16 Nov. 1983 (AD-P003488) Avail: NTIS HC A17/MF A01 CSCL 09B

A software progress tracking system which uses an earned point scheme has been successfully used to monitor software development on several large simulator programs. Points are assigned for each step in the software development cycle on a per element basis. The steps are hard milestones in which a generated product is accepted by program management. As the products are accepted the associated points are earned. The ratio of earned points to total possible points is compiled on an element, functional area, or total software system basis to determine progress achieved. A report generator program usually resident on the simulator computational system, tabulates the data in a variety of management reports. The system as implemented is flexible, highly automated, and is closely coupled to configuration management systems and software quality assurance procedures to ensure validity of data. The accumulated point values are quickly ascertained, objective, and based on the point values provide an accurate measure of progress, deviation from schedule, and prediction of future progress.

GRA

N84-32302# General Accounting Office, Washington, D. C. Resources Community and Economic Development Div.

DEPARTMENT OF ENERGY'S ACTIVITIES TO LIMIT DISTRIBUTION OF CERTAIN UNCLASSIFIED SCIENTIFIC AND TECHNICAL INFORMATION

30 Mar. 1984 28 p (PB84-189158; B8212184; GAO/RCED-84-129) Avail: NTIS HC A03/MF A01 CSCL 05B

The Department of Energy is a major publisher of unclassified scientific and technical information. The Technical Information Center, the Department's repository, sends most of its unclassified information to the National Technical Information Service, which sells it to the public. However, some of the information is limited to distribution within the federal government because it involves nuclear safety matters; securing foreign research results; or protecting patentable, proprietary, and other information. This report describes the Department's procedures and controls for determining, distributing, and accessing unclassified information that is not made available to the public.

GRA

N84-33057# National Bureau of Standards, Washington, D.C.
I/O CHANNEL INTERFACE

29 Jul. 1983 117 p refs (NBS-FIPS-PUB-60-2) Avail: NTIS HC A06/MF A01

The functional, electrical, and mechanical interface specifications for connecting computer peripheral equipment as a part of automatic data processing (ADP) systems are defined. This standard, and a companion standard for power control, defines the hardware characteristics for the I/O channel level interface. Device class specific operational specifications standards are also required for each class of peripheral device to achieve full plug-to-plug interchangeability of peripheral components. These operational specifications standard will be proposed as Federal Information Processing Standards to accompany this standard as they are developed. The employment of this I/O Channel Interface standard is to reduce the cost of data processing requirements through increasing its available alternative sources of supply for computer system components at the time of initial system acquisition in system replacement and augmentation and in system component replacement. This standard is expected to lead to improved reutilization of system components.

E.A.K.

N84-33260 Connecticut Univ., Storrs.

A STUDY OF THE EXTENT OF AUTOMATION IN SMALL COLLEGE LIBRARIES AND RELATIONSHIPS OF ATTITUDES OF LIBRARY DIRECTORS TOWARD IT Ph.D. Thesis

L. W. YOTHER 1984 147 p

Avail: Univ. Microfilms Order No. DA8410827

Library automation in small college libraries is a relatively new application for computers. Little has been known about the extent of library automation already in place, the attitudes of library directors toward it, or the relationships of these attitudes to the extent of automation in libraries. This has been especially true for small academic libraries with fewer than 100,000 volumes. This study surveyed a random national sample of 175 such libraries to determine the extent of automation in place, the attitudes of library directors toward automation in general, and the relationships of these attitudes and selected variables to the extent of automation in small libraries. The data on extent of automation were subjected to analysis of variance and stepwise multiple regression, to determine the relationship between the degree of library automation and size of collection, institutional control, background of directors and staff members, and attitudes toward library automation held by library directors. A .05 level of significance was applied to all resulting values. Dissert. Abstr.

N84-33266*# National Aeronautics and Space Administration, Washington, D. C.

NASA ADMINISTRATIVE DATA BASE MANAGEMENT SYSTEMS, 1984

J. D. RADOSEVICH, ed. Sep. 1984 126 p refs Conf. held in Hampton, Va., 6-7 Jun. 1984

(NASA-CP-2323; NAS 1.55:2323) Avail: NTIS HC A07/MF A01 CSCL 05B

Strategies for converting to a data base management system (DBMS) and the implementation of the software packages necessary are discussed. Experiences with DBMS at various NASA centers are related including Langley's ADABAS/NATURAL and the NEMS subsystem of the NASA metrology information system. The value of the integrated workstation with a personal computer is explored.

N84-33268*# National Aeronautics and Space Administration, Washington, D. C.

EFFECTIVE ORGANIZATIONAL SOLUTIONS FOR IMPLEMENTATION OF DBMS SOFTWARE PACKAGES

D. JONES *In its* NASA Admin. Data Base Management Systems, 1984 p 11-20 Sep. 1984

Avail: NTIS HC A07/MF A01 CSCL 05B

The space telescope management information system development effort is a guideline for discussing effective organizational solutions used in implementing DBMS software. Focus is on the importance of strategic planning. The value of constructing an information system architecture to conform to the organization's managerial needs, the need for a senior decision maker, dealing with shifting user requirements, and the establishment of a reliable working relationship with the DBMS vendor are examined. Requirements for a schedule to demonstrate progress against a defined timeline and the importance of continued monitoring for production software control, production data control, and software enhancements are also discussed. A.R.H.

N84-33269*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

ADMINISTRATIVE AUTOMATION IN A SCIENTIFIC ENVIRONMENT

J. R. JARRETT *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 21-28 Sep. 1984

Avail: NTIS HC A07/MF A01 CSCL 05B

Although the scientific personnel at GSFC were advanced in the development and use of hardware and software for scientific applications, resistance to the use of automation or purchase of terminals, software and services, specifically for administrative functions was widespread. The approach used to address problems and constraints and plans for administrative automation within the

Space and Earth Sciences Directorate are delineated. Accomplishments thus far include reduction of paperwork and manual efforts; improved communications through teletype and committees; additional support staff; increased awareness at all levels on ergonomic concerns and the need for training; better equipment; improved ADP skills through experience; management commitment; and an overall strategy for automating. A.R.H.

N84-33270*# National Aeronautics and Space Administration, John F. Kennedy Space Center, Cocoa Beach, Fla.

THE ADMINISTRATIVE WINDOW INTO THE INTEGRATED DBMS

G. H. BROCK *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 29-50 Sep. 1984

Avail: NTIS HC A07/MF A01 CSCL 05B

A good office automation system manned by a team of facilitators seeking opportunities to serve end users could go a long way toward defining a DBMS that serves management. The problems of DBMS organization, alternative approaches to solving some of the major problems, problems that may have no solution, and how office automation fits into the development of the manager's management information system are discussed. A.R.H.

N84-33271*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

A USER VIEW OF OFFICE AUTOMATION OR THE INTEGRATED WORKSTATION

E. R. SCHMERLING *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 51-54 Sep. 1984

Avail: NTIS HC A07/MF A01 CSCL 05B

Central data bases are useful only if they are kept up to date and easily accessible in an interactive (query) mode rather than in monthly reports that may be out of date and must be searched by hand. The concepts of automatic data capture, data base management and query languages require good communications and readily available work stations to be useful. The minimal necessary work station is a personal computer which can be an important office tool if connected into other office machines and properly integrated into an office system. It has a great deal of flexibility and can often be tailored to suit the tastes, work habits and requirements of the user. Unlike dumb terminals, there is less tendency to saturate a central computer, since its free standing capabilities are available after down loading a selection of data. The PC also permits the sharing of many other facilities, like larger computing power, sophisticated graphics programs, laser printers and communications. It can provide rapid access to common data bases able to provide more up to date information than printed reports. Portable computers can access the same familiar office facilities from anywhere in the world where a telephone connection can be made. A.R.H.

N84-33284# RAND Corp., Santa Monica, Calif.

INTERACTIVE INFORMATION ENVIRONMENTS: A PLAN FOR ENABLING INTERDISCIPLINARY RESEARCH

L. R. TALBERT, T. K. BIKSON, and N. Z. SHAPIRO Apr. 1984 76 p refs

(RAND/N-2115) Avail: NTIS HC A05/MF A01

The implementation of information technology in organizational settings is examined. Research plans and problems are discussed along with the preliminary procedures and hypotheses. An organizational structure is also provided. M.A.C.

N84-33356# Massachusetts Inst. of Tech., Cambridge.

COMMUNICATION NETWORKS

R. S. KENNEDY, S. S. WAGNER, and E. B. SIA *In its* RLE Progr. Rept. No. 126 p 125-127 Jan. 1984

Avail: NTIS HC A12/MF A01

A research program to determine and demonstrate the principles to be followed in the design of local communication networks as typified by local area networks, private branch exchanges and internetworked collections of such structures is planned. Two fundamental assumptions distinguish the research from much of

the ongoing work: (1) a single integrated system is to provide a set of highly diverse communication services such as interactive terminal service, data base access, file transfers, graphics, and voice and video; and (2) a single mode optical fiber links with very wide bandwidths is economical. These assumptions are not satisfied by the networks now being designed, but based upon the perceived trend toward such integrated diverse services and the declining cost of single mode fiber technology. It is planned for the research to involve theoretical, experimental, and design activities. Author

N84-34202# Sandia Labs., Albuquerque, N. Mex.
SANDIA NATIONAL LABORATORIES ADMINISTRATIVE DATA PROCESSING SYSTEMS

R. H. MCGEE, ed. and I. R. MITCHELL, ed. May 1984 110 p
 (Contract DE-AC04-76DP-00789)
 (DE84-014328; SAND-84-0231) Avail: NTIS HC A06/MF A01

The administrative data processing systems at Sandia Laboratories are divided into common systems, people systems, property systems, procurement systems, and financial systems. The common systems consist of a data dictionary/directory system, which captures data field descriptions, common data input and retrieval systems, and the accounting title master system, the central authority for the accounting system. The people systems support personnel activities at Sandia. The property systems support property, material, inventory, documents, and records. Descriptions of property control, property accounting, property inventory control system, classified material accountability, classified document accountability, and others, are included. Procurement systems support procurement activity, including production of hard copy, summarized data, and procurement reports. Financial systems include payroll, employee accounts, financial modeling, budget, and others. S.B.

N84-34316# Air Command and Staff Coll., Maxwell AFB, Ala.
MANAGING MICROCOMPUTERS: A SURVIVAL KIT FOR FUNCTIONAL MANAGERS

E. C. IVERSTINE Apr. 1984 20 p
 (AD-A144006; AD-E751074; ACSC-84-1345) Avail: NTIS HC A02/MF A01 CSCL 05A

Military and civilian use of microcomputers has expanded at a phenomenal rate. Their popularity stems from the fact that they put computational power in the hands of users. But this capability presents new challenges to functional managers in the military community because they now must manage their computational tools (microcomputers) as well as their work units. This article defines the microcomputer management environment facing functional managers and outlines some principles for meeting this challenge. Author (GRA)

N84-34321*# National Aeronautics and Space Administration, Washington, D. C.

MASTER LIST AND INDEX TO NASA DIRECTIVES

1 Aug. 1984 81 p
 (NASA-TM-87362; NGB-1410.4JJ; NAS 1.15:87362) Avail: NTIS HC A05/MF A01 CSCL 05B

All NASA management directives in force as of August 1, 1984 are listed by major subject headings showing number, effective date, title, responsible office, and distribution code. Delegations of authority in print by that date are listed numerically as well as by the installation or office to which special authority is assigned. Other consolidated lists show all management handbooks, directives applicable to the Jet Propulsion Laboratory, directives published in the Code of Federal Regulations, complementary manuals, and NASA safety standards. Distribution policies and instructions for ordering directives are included. A.R.H.

N84-34323# Naval Postgraduate School, Monterey, Calif.
THE SIMULATION OF A MAJOR AUTOMATED INFORMATION SYSTEM (AIS) ON A MICROCOMPUTER M.S. Thesis
 K. V. LOCKETT and M. E. ONEIL Mar. 1984 188 p
 (AD-A143599) Avail: NTIS HC A09/MF A01 CSCL 09B

The objective of this thesis is to determine if a mainframe computer Automated Information System can be simulated on a conventional microcomputer. To this end, the topical areas of software, hardware, the simulation development lifecycle, and systems testing and evaluation are explored in-depth. The purpose of this in-depth subject area examination is to demonstrate the tradeoffs and decision points encountered in the systems management lifecycle. Recommendations based upon these tradeoffs and decisions are then presented. Lastly, the conclusions address the attainment of the thesis objective. Author (GRA)

N84-34326# Naval Postgraduate School, Monterey, Calif.
THE CREATION OF A CENTRAL DATABASE ON A MICROCOMPUTER NETWORK M.S. Thesis

J. G. BOYNTON and R. G. NICHOLS Mar. 1984 219 p
 (AD-A143875) Avail: NTIS HC A10/MF A01 CSCL 09B

This thesis discusses the design and development of a central database on a network of microcomputers. It provides an overview of the methodology utilized in creating the system, along with the problems associated with a central database. The thesis includes the source listings for the creation of the system and a discussion of the difficulties of controlling contention within the networked database environment. Author (GRA)

N84-35131# Naval Postgraduate School, Monterey, Calif.
COMPARATIVE ANALYSIS OF GOVERNMENT AND PRIVATE SECTOR ADP ACQUISITION M.S. Thesis

S. L. LARUE and J. M. DELORENZO Mar. 1984 132 p
 (AD-A144523) Avail: NTIS HC A07/MF A01 CSCL 05A

This thesis has identified the primary regulatory and administrative requirements related to the acquisition of major automated information systems (AIS). In addition, case analysis was performed on current ADP projects to evaluate the application of acquisition directives to obtain pertinent cost data for model development. A baseline model was created from available data using the Interactive Financial Planning System (IRPS). This model delineates the cost elements germane to the approval and acquisition phases of the life cycle management process. This concluded the initial phase of an effort towards a comparison of government and private sector acquisition processes. Further analysis of these acquisition processes is recommended for continued model refinement, including decision support system applications. Author (GRA)

06

RESEARCH AND DEVELOPMENT

Includes Contracts and Contract Management, Project Management, Program Management, Research Projects and Research Facilities, Scientific Research, Innovations and Inventions, Technology Transfer and Utilization, R & D Resources, Agency, National and International R & D.

A84-15303**HUMAN ORGANIZATION [ORGANISATION HUMAINE]**

M. G. DELMAS (Centre National d'Etudes Spatiales, Toulouse, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings. Toulouse, Cepadues-Editions, 1983, p. 95-108. In French.

The organizations required for a large space project are discussed, along with several of the tasks involved. A large space project is affected by its international effects, the necessary technical interfaces, the environments in the various countries manufacturing subsystems, and political and industrial limitations.

The Telecom I project is cited as an example of a goal with international implications. The participants were the client, the project manager, the industries involved, the work managers, the subcontractors, and the equipment suppliers. It was found that the organization was not amenable to technical hierarchies, and a matrix organization functioned instead. A project head was appointed and supplied with a management structure to administer the work. The project leader coordinated the individual subprograms and reported directly to the governing agency. Simultaneously, a ground station network was established for tracking and controlling the satellite, as well as transmitting signals and receiving data. The human interactions on an organization level were affected by the location of authority, the dynamism of the organization, the relations between the people involved, the management actions, and the experience of the participants. M.S.K.

A84-15304

THE CONTRACT [LE CONTRAT]

M. M. VANHEMS (Centre National d'Etudes Spatiales, Toulouse, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 121-140. In French.

Features of contracts, negotiations, and other considerations which are germane to the realization of large space projects are described. The justifications, specifications, consultations, selection of suppliers, and negotiating considerations for contracts are outlined. Three types of contracts are used: fixed price, controlled expenses, and incentive contracts with penalty clauses for delays. The contracts must take account of interest, carry a bill of particulars, detail the costs, cite administrative fees and assign duties, and identify suppliers. Price sampling techniques are detailed in terms of units of account, and attention is given to methods of modifying contracts in order to meet new or reformulated requirements, particularly those due to unanticipated cost increases for supplies. M.S.K.

A84-15305

THE PROGRESSION OF PROJECTS [LE DEROULEMENT DES PROJETS]

B. ESTADIEU (Centre National d'Etudes Spatiales, Toulouse, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 141-165. In French. refs

Milestones and managerial actions which are necessary during various specified phases of a large space project are explored. The space projects are organized by phases to coordinate dispersed work, reduce risk, and for economic purposes such as selecting areas needing the greatest attention. The phases include mission analysis, feasibility analysis, design, manufacture, production, and use. NASA avoids following the phases rigorously in order to maintain flexibility during development. Industrial feedback is required during the different phases, as is constant monitoring of developments carried out in other countries. Reviews are performed at each phase to maintain coherence in the work and assure that the goals are being met or suitably modified. The reviews cover all aspects of the projects. M.S.K.

A84-15306

MANAGEMENT OF A SPACE PROJECT [LA CONDUITE D'UN PROJET SPATIAL]

M. PH. COUILLARD (Centre National d'Etudes Spatiales, Toulouse, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 171-191. In French.

Management techniques and organization proven in the development of the Ariane launcher, the SPOT satellite, and the DBS satellite for France are outlined. It is necessary for management to be interfaced with the technical difficulties encountered in the progress of the project and to be able to modify the work schedule and budget accordingly. The end goal of most space projects is a product which will be launched into space and will no longer be available for physical modification

once in use. Each project takes from 4-7 years to complete, and must be accomplished from as diverse means as possible to assure success, while simultaneously being broken down into various subprograms in order to progress on the entire system. The framework devised for the project therefore is crucial to realization of the finished product. Attention is also necessary for political, commercial, budgetary, and temporal factors. Techniques used to cut up the development of the Ariane launch vehicle into subprograms are detailed. M.S.K.

A84-15324

THE MANAGEMENT OF LARGE PROJECTS - CASE STUDY: ARIANE [LA GESTION DES GRANDS PROJETS - ETUDE DE CAS: ARIANE]

R. VIGNELLES (Centre National d'Etudes Spatiales, Evry, Essonne, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 751-771. In French.

The history and management structure of the Ariane development program are reviewed. The initiation of the project in 1973, the original objectives, and the overall organizational structure are considered, and the development plan is shown to be based on a compromise between the need to delay tests of an assembly until its components are matured and the need to incorporate integration-testing results into the final subassembly design. The plans for stage development, equipment-bay design and testing, system tests, and flight tests are summarized, and the configuration choices are defined. The management specifications included in all contracts to maximize communication, visibility, and coordination among the ten nations and more than 40 firms participating in the Ariane project are characterized, including those on industrial organization, the work-breakdown structure, configuration management, quality and reliability, continual project control, documentation, and contractual framework. The further development from Ariane 1 to Ariane 2-3 and the plans for Ariane 4 are surveyed. Block diagrams of the management structure are provided. T.K.

A84-15325

THE SPACELAB PROGRAM - THE MANAGEMENT OF THE PROGRAM, PROBLEMS ENCOUNTERED AND THE SOLUTIONS ADOPTED [LE PROGRAMME SPACELAB - LA GESTION DU PROGRAMME, LES PROBLEMES RENCONTRES ET LES SOLUTIONS ADOPTÉES]

B. R. K. PFEIFFER (ESA, European Space Research and Technology Centre, Noordwijk, Netherlands) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 773-838. In French.

The management techniques applied by ESA in the Spacelab (SL) development program are reviewed critically. The history, objectives, and contractual responsibilities of ESA and NASA are summarized, and the SL modules to be supplied by ESA are characterized. The management structure is presented, with discussion of the roles of ESA and industry, the phases of the program, the principal reviews, documentation, verification, ongoing control of specifications, quality control and security, cost control and the evolution of the budget, the geographical distribution of the contracts, delay control, and configuration management. Block diagrams, sample worksheets, graphs, and maps are provided. The problems of the SL program are seen as primarily technical, associated with an insufficient initial technical base, overly diffuse management control, substantial modifications during development, and contractual and economic difficulties arising from the technical problems. It is shown that the management techniques adopted during the second half of the program limited the cost overrun to 40 percent of the original budget and ensured the successful fulfillment of the technical objectives. T.K.

A84-15598

R&D MANAGEMENT AND FINANCIAL PERFORMANCE

H. HORT (Saarland, Universitaet, Saarbruecken, West Germany) and O. H. POENSGEN IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-30, Nov. 1983, p. 212-222. Research supported by the Deutsche Forschungsgemeinschaft. refs

The overall management of R&D activity within a company is examined in terms of contrasts between more and less successful firms. An R&D department is characterized as operating with a higher degree of uncertainty, at least as perceived by the management. A problem exists in integrating the R&D activities within the rest of the firm, a situation that may be achieved by setting long-range goals for the department. The inputs to the R&D department have been proven to be most successful if originating from marketing. It is assumed, though, that the success of R&D will ultimately depend on the quality of the management throughout the firm. A questionnaire circulated among 68 companies with significant R&D expenditures demonstrated that R&D must become a centralized unit as a company grows. A scientific discipline orientation was more successful than a project orientation. It is necessary for R&D management to play a role in shaping the company goals. The percentage of total revenue devoted to R&D grew with the size of the more successful companies, which also had manufacturing management participate during on-going R&D. M.S.K.

A84-22854#

PROJECT MANAGEMENT IN THE '80S [PROJEKTMANAGEMENT IN DEN 80ER JAHREN]

B.-J. MADAUSS (Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn, West Germany) Deutsche Gesellschaft fuer Metallkunde, Jahrestagung, Wuerzburg, West Germany, Nov. 17, 18, 1983, Paper. 9 p. In German. refs (MBB-UR-631-83-OE)

The importance of project management for industry and government, the development of modern project management techniques, and predicted trends for the decade are considered. A list of recommended subjects for a training program in project management is presented. C.D.

A84-23988

THE OCCUPATIONAL INTERESTS OF R&D MANAGERS AND TECHNICAL SPECIALISTS - SOME PRELIMINARY FINDINGS

R. E. HILL, P. F. ROSELLE (Michigan, University, Ann Arbor, MI), and M. T. TINKHAM (Evansville, University, Evansville, IN) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Feb. 1984, p. 12-17. refs

This study compared the occupational interest patterns of technical specialists and R&D Managers. The hypothesis was that R&D managers would be similar to technical specialists in the scientific/engineering domain, but exhibit comparatively higher levels in the management/organizational interest domain. The findings supported the hypothesis and indicated R&D managers reflect a psychological functioning which simultaneously incorporates the conflict between managerial and scientific motives. This was discussed in terms of increasing the effective utilization of technical personnel, and also in terms of specialized career development applications. Author

A84-31214

NEEDS ASSESSMENT FOR SUPPORT UNITS IN AN R & D ORGANIZATION

F. ROBLES and R. RADOSEVICH (New Mexico, University, Albuquerque, NM) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, May 1984, p. 70-75. refs

The relationship between support units and projects groups in R&D organizations has been neglected. This article reports a study of the role and mission of an electronic fabrication support unit among project users and other relevant management personnel of a major national laboratory. The inability to be cost efficient for both prototype development and low-cost volume-fabrication projects resulted in criticism, dissatisfaction, and a poor image of

the supporting unit in this organization. Given the difficulty in controlling allocated costs, the supporting unit may improve its image by differentiating the demands through separate organizations, cost policies, and integration mechanisms. Author

A84-35922#

METHODS AND OPERATIONAL MEANS FOR PROJECT MANAGEMENT [METHODEN UND ARBEITSMITTEL FUER DAS PROJEKTMANAGEMENT]

W.-D. PILZ (Messerschmitt-Boelkow-Blohm GmbH, Munich, West Germany) Verein Deutscher Ingenieure and Gesellschaft Energietechnik, Jahrestagung, Universitaet Essen - Gesamthochschule, Essen, West Germany, Feb. 27, 28, 1984, Paper. 21 p. In German. (MBB-UR-673-84-OE)

The economical-political situation of today leads to problems which can only be solved with the aid of technical systems of growing complexity. Risks related to the implementation and the utilization of such systems are increasing, and it becomes often very difficult to recognize aspects and relations concerning the technical system and its operation. For these reasons, the concepts and operational procedures of systems engineering become increasingly vital for the execution of the tasks of project management in connection with the implementation of such systems. The present investigation provides a description of the various methods and operational approaches which are now available to project management. Attention is given to the importance of the correct definition of the objectives of a project, the structuralization of the project, approaches for dealing with risks, aspects of configurational control, quality assurance, the employment of technical standards, legal relations, scheduling, and cost control. G.R.

A84-42620

'REVERSE' TRANSFERS OF TECHNOLOGY FROM OVERSEAS SUBSIDIARIES TO AMERICAN FIRMS

E. MANSFIELD (Pennsylvania, University, Philadelphia, PA) and A. ROMEO (Connecticut, University, Storrs, CT) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Aug. 1984, p. 122-127. NSF-supported research. refs

Although U.S. firms perform about 10 percent of their R and D overseas, very little is known about the transfer of technology and overseas subsidiaries to their U.S. parents. This paper presents the results of what seems to be the first systematic study of the extent, growth, nature, and effect of such 'reverse' technology transfer. The results, based on detailed data regarding 29 overseas laboratories (which account for about 10 percent of all overseas R and D spending by U.S.-based firms), have implications for public policy and for the analysis of firms' productivity and profits. It is believed that they will be of interest to management scientists, engineers, and economists. Author

A84-42621

AN EVALUATION OF THE EFFECTIVENESS OF PROJECT CONTROL SYSTEMS

R. MIGHT (USAF, Fighter Div., Washington, DC) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Aug. 1984, p. 127-137.

Researchers and practitioners have been unable to identify a general set of guidelines or develop a prescriptive model for the project manager to use when selecting a project control system. The research presented here extends and integrates areas of past research on project control systems; it addresses the interactions between project control systems and the situations in which they are implemented. The results provide insights into the effectiveness of control systems which were not evident when the control system and situational conditions were treated separately. The research is based on an empirical study of 103 development projects. The results clearly show that the interactions between control systems and the situations in which they are used have very significant relationships with project success. Author

06 RESEARCH AND DEVELOPMENT

N84-10357# Joint Publications Research Service, Arlington, Va.
SCIENTIST DISCUSSES PROBLEMS IN INTRODUCING NEW TECHNOLOGY

G. POPOV *In its* USSR Rept.: Sci. and Technol., No. 19 (JPRS-84497) p 56-60 7 Oct. 1983 Transl. into ENGLISH from Sov. Rossiya (Moscow), 27 May 1983 p 2

Avail: NTIS HC A06

The problems of introducing new technologies to science are discussed. It is found that everything depends on production, which is a poor introduction to innovations. Production, however, is the main thing. Listening to the plants and sectorial organs is recommended while the problem of new technology introduction could be changed. The introductory stage appears to be weakest link since it is the introduction or a proving ground where the imperfections of the entire mechanism with control scientific and technical progress is graphically demonstrated. E.A.K.

N84-11035# Joint Publications Research Service, Arlington, Va.
THE SOCIALIST AND DEVELOPING COUNTRIES: TECHNOLOGY TRANSFER

S. SIMANOVSKY *In its* USSR Rept.: Sci. and Technol. Policy, No. 18 (JPRS-84484) p 1-15 6 Oct. 1983 Transl. into ENGLISH from Foreign Trade (USSR), no. 3, Avail: NTIS HC A05 Mar. 1983 p 28-35

The transfer of technology as a basic means accelerating industrialization in the developing countries has extended beyond the framework of the specific problems; it now reflects the essence and character of relations between the industrialized countries and the newly independent nations. Elaboration of an agreed new organizational basis for the technology transfer to the developing countries and for improving its economic mechanism with due regard for the interests of all its participants is one of the urgent tasks for restructuring international economic relations and establishing a new international economic order. Author

N84-11039# Joint Publications Research Service, Arlington, Va.
ORGANIZATIONAL IMPROVEMENTS IN CEMA SCIENTIFIC, TECHNICAL COOPERATION SOUGHT

V. LEONTEV *In its* USSR Rept.: Sci. and Technol. Policy, No. 18 (JPRS-84484) p 39-43 6 Oct. 1983 Transl. into ENGLISH from Ekonomicheskoye Sotrudnichestvo Stran Chlenov Avail: NTIS HC A05 (USSR), no. 4, Apr. 1983 p 20-22

Scientific-technical cooperation among the CEMA member-countries has the following goals: Unification of the efforts of engineers and scientists and concentration of the resources of the fraternal countries for achieving the maximum results with regard to the problems of mutual interest, in particular, with regard to working out the introducing into production competitive models of machinery and equipment, along with technology new in principle; creation of a mutually coordinated scientific-technical potential; and development on the basis of the achievements of science and technology in the countries involved an international specialization and cooperation in production. Author

N84-11042# Joint Publications Research Service, Arlington, Va.
LACK OF SUPPORT FOR INTRODUCTION OF SOVIET INVENTIONS SCORED

L. LEVITSKIY *In its* USSR Rept.: Sci. and Technol. Policy, No. 18 (JPRS-84484) p 52-55 6 Oct. 1983 Transl. into ENGLISH from Izvestiya (USSR), 1 Jul. 1983 p 3 Avail: NTIS HC A05

The need for equipment and inventions to be transfer to industrial uses is stressed. The failure of industry and scientific research to merge is a problem to the economic development within the country. Stress was placed on the solution to industrial problems by scientific endeavor. B.G.

N84-11043# Joint Publications Research Service, Arlington, Va.
SIXTH ALL-UNION CONGRESS OF INVENTORS HELD

In its USSR Rept.: Sci. and Technol. Policy, No. 18 (JPRS-84484) p 56-65 6 Oct. 1983 Transl. into ENGLISH from Trud (USSR), 26 May 1983 p 1-2

Avail: NTIS HC A05

Vast opportunities for scientific and technical creativity are afforded to the working people of our country. The army of millions of innovators is making its own weighty contribution to the fulfillment of the decisions of the 26th CPSU Congress. The broad expansion of scientific and technical progress and the mass mobilization of direct participants in production for creative exploration are actively promoted by the All-Union Society of Inventors and Rationalizers VOIR. Currently it has a membership of nearly 23 million production pace-setters, experts and scientists. Author

N84-11044# Joint Publications Research Service, Arlington, Va.
APPLICATIONS OF ACADEMIC RESEARCH NEGLECTED BY INDUSTRY

V. FEDYAKIN *In its* USSR Rept.: Sci. and Technol. Policy, No. 18 (JPRS-84484) p 66-69 6 Oct. 1983 Transl. into ENGLISH from Sov. Rossiya (USSR), 20 Apr. 1983 p 2

Avail: NTIS HC A05

The transfer of scientific research to industrial problems often does not happen. Methods to use the research meet with resistance, and so the benefit is lost. Methods of overcoming this difficulty must be found by cooperation of science and industry. Author

N84-11052# National Science Foundation, Washington, D.C.
Div. of Policy Research and Analysis.

PAPERS FOR AND A SUMMARY OF A WORKSHOP ON THE ROLE OF BASIC RESEARCH IN SCIENCE AND TECHNOLOGY: CASE STUDIES IN ENERGY R AND D (RESEARCH AND DEVELOPMENT)

1983 266 p Workshop held in Washington, D.C., 12-13 Mar. 1983

(PB83-213637; NSF-83-29; NSF/PRA-83013) Avail: NTIS HC A12/MF A01 CSCL 05A

Six papers are presented that assess both the direct impact of basic research on the advancement of energy science and technology and the indirect benefits of that research to society. The various research areas of the Department of Energy's Basic Energy Science Program are described and a set of criteria is presented for use in allocating the limited resources available for basic energy research funding. Distinctions are drawn between basic and applied research in industry. It is pointed out that basic energy research tends to be carried out in large, centralized laboratories within organizations that are themselves large, diversified, and multinational. The effects of the economy on near-and medium-term research and development (R&D) programs are examined. Author (GRA)

N84-11977# Argonne National Lab., Ill. Engineering Div. paa 02ed.

PROJECT MANAGER'S GUIDE

J. J. ENGLISH and G. A. WHITTINGTON Jun. 1983 172 p refs

(Contract W-31-109-ENG-38)

(DE83-014454; ANL/ENG-PMS0-02) Avail: NTIS HC A08/MF A01

Guidance to ANL project managers is provided. Project management policy and procedures are provided by the ANL Policy Manual System. ANL management, at an appropriate level commensurate with the size, complexity and sensitivity of a project, assigns responsibilities and establishes project management requirements for individual projects. With management approval, the project manager selects the specific management tools and procedures that he will utilize in the execution of the project. This guide describes an approach to project management that is intended to assist him in the selection process. DOE

N84-14965*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PROJECT MANAGEMENT TECHNIQUES FOR HIGHLY INTEGRATED PROGRAMS

J. F. STEWART and C. A. BAUER Dec. 1983 13 p refs
Presented at the 2nd Flight Test Conf., Las Vegas, Nev., 16-18 Nov. 1983

(NASA-TM-86023; H-1211; NAS 1.15:86023) Avail: NTIS HC A02/MF A01 CSCL 05A

The management and control of a representative, highly integrated high-technology project, in the X-29A aircraft flight test project is addressed. The X-29A research aircraft required the development and integration of eight distinct technologies in one aircraft. The project management system developed for the X-29A flight test program focuses on the dynamic interactions and the intercommunication among components of the system. The insights gained from the new conceptual framework permitted subordination of departments to more functional units of decisionmaking, information processing, and communication networks. These processes were used to develop a project management system for the X-29A around the information flows that minimized the effects inherent in sampled-data systems and exploited the closed-loop multivariable nature of highly integrated projects. Author

N84-14971# Northeastern Univ., Boston, Mass. College of Business Administration.

FACTORS EXPLAINING DECISIONS TO TERMINATE OR CONTINUE AN R AND D PROJECT, EXECUTIVE SUMMARY Final Report

R. BALACHANDRA and J. A. RAELIN May 1983 9 p 2 Vol.
(Contract NSF ISI-81-05585)

(PB83-256602; NSF/ISTI/PIR-81-05585-1) Avail: NTIS HC A02/MF A01 CSCL 05J

The study was designed to identify and evaluate critical factors underlying decisions to continue or terminate R&D or development projects in private firms after appreciate amounts of investment funds have been expended in those projects. The first part of the study entails a search to identify, reduce, and operationalize both environmental factors (such as government regulations and procurement activities; actions by major consumer groups; and the degree of product competition) and organizational factors (such as degree of support from top management and R&D management or the presence of a project champion) and to account for the influence of these factors separately from the influence of project specific factors (such as the probabilities for technical and commercial success, expected profits after commercialization occurs, and expected capital requirements). Author (GRA)

N84-14972# Northeastern Univ., Boston, Mass. College of Business Administration.

FACTORS EXPLAINING DECISIONS TO TERMINATE OR CONTINUE AN R AND D PROJECT Final Report

R. BALACHANDRA and J. A. RAELIN (Boston College) May 1983 268 p refs 2 Vol.

(Contract NSF ISI-81-05585)
(PB83-256594; ISTI/PIR-81-05585-2) Avail: NTIS HC A12/MF A01 CSCL 05J

This study has identified a set of factors which explains the decisions to terminate or continue commercial R&D projects. From a wide cross section of industry in the United States, 114 commercial R&D projects were studied. The resulting model was able to classify the projects into two groups (terminated and successfully completed) with a high degree of accuracy (92% correct classification) using only 14 variables. Author (GRA)

N84-21397# Oak Ridge National Lab., Tenn.

ORNL TRENDS AND BALANCES, 1984-1989 Annual Report

Jan. 1984 52 p

(Contract W-7405-ENG-26)

(DE84-006320; ORNL/PPA-84/1; AR-6) Avail: NTIS HC A04/MF A01

Institutional planning and long range goals are discussed. Topics covered include: history and accomplishments of ORNL; present role; strategic planning; research and development programs; laboratory organizations; nuclear and engineering technology programs; advanced energy systems programs; basic physical sciences programs; biomedical and environmental sciences programs; the Carbide years; and summary resource projections.

DOE

N84-23308# Air Force Space Div., Los Angeles, Calif.

CLOSING THE GAP BETWEEN R AND D AND APPLICATION IN ACADEME TO BETTER SUPPORT GOVERNMENT AND INDUSTRY Final Report

Y. F. HOWERTON /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 88-89 1983

(AD-P002761) Avail: NTIS HC A24/MF A01 CSCL 15E

To successfully accomplish the goals implicit in defense research and development, (R&D), the interrelationship of Government, Industry, and Academe deserves increased attention. While the relationship between Government and Industry has been firmly established, it is in the Academic arena that a better clarity of direction regarding the pursuit of research and development is needed. The lag between research and development and applications is greater in education than in almost any other field. This is particularly unfortunate at a time of a technological resurgence. Perhaps this vacuum can best be examined by looking at the changing trends in education. Until most recently the emphasis on scientific training was not a major priority in the secondary schools and universities. Only recently has attention been drawn to the increasing technological advances and shortage of qualified personnel. With the assistance of funds from the Government, Industry, and Private Foundations like the Alfred P. Sloan Foundation and others; an emphasis on scientific training has taken on a new emphasis. Author (GRA)

N84-23315*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

GOVERNMENT - CONTRACTOR INTERACTION Final Report

D. M. THOMAS /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 118-121 1983

(AD-P002768) Avail: NTIS HC A24/MF A01 CSCL 15E

The development of the Administrative Contracting Officer represents an advance in the Government system of contract management because it provides an individual with knowledge, time, and a specialized function to insure performance of Government contracts. However, the development has created a dichotomy between the award and the post-award function which increases the adversary relationship with Government contractors. This paper advocates that this adversary relationship can be decreased if PCOs and ACOs are provided with opportunities to serve in the assignments of the other. Author (GRA)

N84-23323# Virginia Univ., Charlottesville.

AWARD FEE CONTRACT PROVISIONS AS A PROGRAM MANAGEMENT TOOL Final Report

R. F. DEMONG /In AF Business Research Management Center Proc. of the Federal Acquisition Res. Symp. with Theme p 168-174 1983

(AD-P002776) Avail: NTIS HC A24/MF A01 CSCL 15E

Award fee contract provisions can be used as a program management tool. Award fee contracts have been found to be a cost effective means of encouraging contractors to surpass the specifications of the contract. Award fee contracting can be successfully used in the dynamic environment of R and D programs as well as full scale development programs. Award fee contracting

06 RESEARCH AND DEVELOPMENT

relies on other forms of motivation than just the profit motive. The frequent evaluations used in award fee contracting give the contractor (including its managers and employees) timely feedback on its performance. These evaluations implicitly tell the contractor what the government's priorities are. This evaluation process also enables the government to better define its requirements. It serves as a motivation tool in that the managers will strive to make the evaluation look as good as possible. Timely and high level government involvement have been found to be important in the success of award fee contracting. Author (GRA)

N84-23336# Defense Systems Management School, Fort Belvoir, Va.

MANAGING FOR SUCCESS IN DEFENSE SYSTEMS ACQUISITION Final Report

J. S. BAUMGARTNER, C. BROWN, and P. KELLEY In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 233-238 1983 (AD-P002789) Avail: NTIS HC A24/MF A01 CSCL 15E

This study, an offshoot of a DoD cost growth study, was conducted to identify elements common to successful programs, programs that met most of their cost, schedule, and performance goals, and worked well when fielded. Key government and industry officials of twelve successful programs were interviewed to find out how success is measured and what impact various forces had on the success of these systems. The primary measure of success is that the system worked well when fielded. Main elements of a successful program are stability, realistic requirements, good people, good leadership and, particularly, confidence and teamwork between the program office and the contractor. The PM's tenure, pushing the state-of-the-art in technology, and meeting the requirements of regulations and directives have little impact on the success of a program. Outside influences are, on balance, helpful. The people we interviewed enjoyed their jobs and the challenges of program management. One program manager said it was the finest job he ever had--high risk, high rolling. A Navy PM said it was the closest thing ashore to the command of a ship. Author (GRA)

N84-23367# Defense Systems Management School, Fort Belvoir, Va.

DEFENSE SYSTEMS ACQUISITION REVIEW PROCESS: A HISTORY AND EVALUATION Final Report

D. D. ACKER In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 435-445 1983

(AD-P002822) Avail: NTIS HC A24/MF A01 CSCL 15A

This paper presents the salient points from a 650-page report, and some of my comments regarding the effectiveness and efficiency of the defense systems acquisition review process. At the outset, the origin and evolution of the Defense Systems Acquisition Review Council (DSARC) and the Defense Resources Board (DRB) will be reviewed. Then observations and perceptions of the review process will be made based upon an analysis of several defense system programs. The fundamental question to be answered by the evaluation of the review process was whether experience has shown that DSARC reviews are still the most effective way to ensure a smooth transition of a defense system program from one program phase to the next phase. The experience data base used in answering this question was the result of: (1) fact-finding investigations of 16 programs, and (2) interviews with current and prior DoD officials having defense system management knowledge and experience. Conclusions and recommendations are offered based upon the results of the evaluation. Author (GRA)

N84-23369# Pittsburgh Univ., Pa.

PROJECT MANAGEMENT: EVOLUTION AND INFLUENCE Final Report

D. I. CLELAND In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 454-459 1983

(AD-P002824) Avail: NTIS HC A24/MF A01 CSCL 05A

This paper will briefly examine the evolution of the theory and practice of project (program) management as an integral part of the management discipline. This examination will hint at the origins of project (program) management and how it has influenced the management of contemporary organizations. The authors will review some of the influences that project management has had on contemporary organizations. GRA

N84-23377# Defense Technical Information Center, Alexandria, Va.

STRENGTHENING SMALL BUSINESS PARTICIPATION IN DEPARTMENT OF DEFENSE EXTRAMURAL RESEARCH AND DEVELOPMENT Final Report

B. K. DENNIS In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 507-511 1983

(AD-P002832) Avail: NTIS HC A24/MF A01 CSCL 05A

This paper discusses steps taken by the Defense Technical Information Center (DTIC) to strengthen small business participation in DoD extramural R&D, indicates a need for explicit attention to information transfer requirements by R&D contract administrators and concludes with a suggestion to the DoD contract administration community. Many factors impede small business efforts to do R&D business with the federal government. These run the gamut from federal procurement policies, regulations, and procedures; beliefs, biases, and practices of federal R&D people and their management systems; and the formidable advantages of bigness in the federal marketplace. Information transfer issues exacerbate the impacts of all the above and further reduce small business capabilities to compete for and to perform federal agency-particularly DoD--R&D projects. The studies and testimony leading to the Small Business Innovation Development Act of 1982 indicated a need for change in federal agency approaches to R&D contracting. DTIC's approach has been to mitigate the impacts of information transfer barriers on small R&D firm efforts to do business with DoD. Author (GRA)

N84-23384# Air Force Systems Command, Bolling AFB, Washington, D.C.

AIR FORCE SYSTEMS COMMAND RESEARCH PLANNING GUIDE (RESEARCH OBJECTIVES)

1 Feb. 1984 209 p

(AD-A138851; AFSC-TR-84-02; AFSC-TR-82-01) Avail: NTIS HC A10/MF A01 CSCL 05A

The purpose of the Planning Guide is to direct the attention of the scientific community to the technology interests of the Air Force, to provide a prospectus of research objectives to which the scientific community can respond, and to document the relevancy of fundamental to the Air Force mission. The research objectives described here represent the combined counsel of technical directors and program managers at the Air Force research and development laboratories. These objectives enunciate scientific opportunities which, when exploited, will provide fundamental knowledge required to develop future Air Force systems, prevent technological surprises, and provide alternatives in solving technological problems which mitigate the quantitative superiority of Air Force systems. The objectives are grouped into eight technical areas: life sciences, materials, geophysics, aerospace vehicles, propulsion and power, weaponry, electronics, and computational sciences. These areas relate directly to Air Force mission areas and involve such scientific disciplines as physics, chemistry, biology, psychology, mathematics, and engineering. GRA

N84-25528# Committee on Armed Services (U. S. House).

TECHNOLOGY TRANSFER

Washington GPO 1984 297 p refs Hearings before the Technol. Transfer Panel of the Comm. on Armed Services, 98th Congr., 1st Sess., 9, 21, 23 Jun.; 13-14 Jul. 1983 (H-REPT-98-15; GPO-27-827) Avail: Committee on Armed Services

The problem of unequal technology transfer between the United States and the U.S.S.R. is discussed with particular emphasis on the National Security of the United States and the economic impact of the information flow. Trade control lists such as the Military Critical Technology List (MCTL) are examined and associated trade control strategies are discussed. Specific industries such as the computer and semiconductor equipment industries are examined.

M.A.C.

N84-26454# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Raumfahrt.

PROJECT MANAGEMENT IN THE 80'S [PROJEKTMANAGEMENT IN DEN 80ER JAHREN]

B. J. MADAUSS 17 Nov. 1983 30 p In GERMAN Presented at GPM Jahrestagung, Wuerzburg, West Germany, 17-18 Nov. 1983

(MBB-UR-631-83-O) Avail: NTIS HC A03/MF A01

Present and future project management characteristics in the aerospace industry are outlined. Topics discussed include: complex system analysis; interdisciplinary task requirements; governmental and industrial common tasks; international cooperation; budget and finance problems.

Transl. by E.A.K.

N84-27585# Naval Postgraduate School, Monterey, Calif.

THE DECISION FOR THE OPTIMAL PRICE IN COMPETITIVE BIDDING: THE CASE OF A KOREAN CONSTRUCTION COMPANY M.S. Thesis

Y. Y. CHA Dec. 1983 65 p

(AD-A140556) Avail: NTIS HC A04/MF A01 CSCL 05A

During recent years, there has been a surprisingly large amount of bidding for overseas projects, especially in the Middle East area. This boom has contributed to the economic development of Korea. But unfortunately, the theoretical and practical studies of these fields are still unsatisfactorily developed. Also the recognition of the scientific factors in the pricing problems by the decision makers is not complete. So, to be successful in this field, management must concentrate their efforts on improving the management system. The purposes of this thesis are; first, to provide a method of determining an optimal competitive bid by a scientific approach, and second, bidding to provide a total system including effectiveness, competitiveness and efficiency. The model presented here can certainly be a powerful and effective tool for competitiveness.

Author (GRA)

N84-28479# Army Research Inst. for the Behavioral and Social Sciences, Alexandria, Va.

RESEARCH INTEGRATION: AN ESSENTIAL FOR DEPARTMENT OF DEFENSE PSYCHOLOGICAL RESEARCH

L. W. OLIVER In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 702-706 Apr. 1984

(AD-P003366) Avail: NTIS HC A99/MF A01 CSCL 05A

The meta-analysis approach has been used to integrate research findings in dozens of topical areas, primary in the disciplines of psychology and education. It is important that such efforts be continued in order to determine what we can confidently conclude from our research as well as to identify gaps in our knowledge. In fact, it is likely that journal editors eventually will require that a meta-analysis approach be used for all literature reviews. Until now, most research integration has concerned the civilian sector. These findings will have their greatest applicability for DoD civilian research. Little quantitative integration seems to have been accomplished for research relating to military populations and settings. At present, we are not certain to what extent findings based on civilian populations apply to the military. It will be important to use the meta-analysis approach to integrate

the military research and then to compare the resulting findings with those of research conducted in the civilian sector. GRA

N84-32293# Sandia Labs., Albuquerque, N. Mex.

TECHNOLOGY TRANSFER REVISITED

R. K. TRAEGER May 1984 11 p refs Presented at Meridian Technol. Transfer Conf., Washington, D.C., 30 May 1984 (Contract DE-AC04-76DP-00789) (DE84-012233; SAND-84-1063C; CONF-8405184-1) Avail: NTIS HC A02/MF A01

Recent concerns about the effectiveness of technology transfer have developed a misconception on both the need for and effectiveness of transfer processes. Research may be successful in solving a national problem but have no industrial application. The majority of the technology transferred is through many people, takes many routes, and usually requires 5 to 10 years to become incorporated; that transfer is invisible. Technology transfer is alive and effective, and should continue to be encouraged. However, transfer has to be done at the individual researcher level. Funds spent on tech transfer offices and studies could be more effectively spent on the research itself.

DOE

N84-32297# Societe Nationale Industrielle Aerospatiale, Les Mureaux (France). Div. Systemes Balistiques et Spatiaux.

TEXT PROCESSING IN THE WRITING OF CONTRACTS [TRAITEMENT DE TEXTE AU SERVICE DE LA REDACTION DES CONTRATS]

J. BERNARD and J. C. MULLER 1984 27 p In FRENCH Presented at Conf., Paris, 9 Mar. 1983

(SNIAS-841-422-102) Avail: NTIS HC A03/MF A01

Compilation problems encountered while drawing up contracts are discussed. Cut and paste methods were reviewed and tasks where EDP can be timesaving are identified. A text processing system is proposed. The system was implemented for a trial period of 15 months. Results are positive operationally, financially, and from a human factors point of view.

Author (ESA)

N84-33286# RAND Corp., Santa Monica, Calif.

SCIENTIFIC AND TECHNICAL INFORMATION TRANSFER: ISSUES AND OPTIONS

T. K. BIKSON, B. E. QUINT, and L. L. JOHNSON Mar. 1984 124 p refs

(Contract NSF PRA-84-00609)

(RAND/N-2131-NSF) Avail: NTIS HC A06/MF A01

This Note describes a study funded under Contract PRA-84-00689 with the Division of Policy Research and Analysis (PRA) of the National Science Foundation (NSF). The purpose of the project is to identify and assess ways to improve the transfer to potential users of knowledge generated by federally funded research in science and technology. To accomplish this purpose, the study examines problems of information quality control and processes by which scientific and technical knowledge is or could be tailored and packaged for users. It draws heavily from the literature listed in the bibliography and from informal telephone conversations with federal officials, industrial users, information producers, and others. The study includes an overview and evaluation of current federal policies and practices, and an assessment of alternative policy options, especially as they may relate to the NSF. Appendixes suggest future directions for research in dissemination policy and present a history of the evolution of relevant federal policies and milestones.

B.W.

N84-33305*# National Aeronautics and Space Administration, Washington, D. C.

SPINOFF, 1984

J. J. HAGGERTY Jul. 1984 127 p refs

(NASA-TM-85596; NAS 1.15:85596) Avail: NTIS HC A07/MF A01; SOD HC CSCL 05A

A pictorial resume that underlines the challenging nature of NASA programs and their extraordinary demands for technological input, is presented. Also, NASA's current mainline programs, which require development of new technology, are given. A representative sampling of spinoff products and processes resulting from

06 RESEARCH AND DEVELOPMENT

technology utilization, or secondary application, and the mechanisms NASA employs to stimulate technology utilization are provided. Contact sources for further information are presented.

S.B.

N84-34647# Joint Publications Research Service, Arlington, Va. **COMMENTARY ON PHILIPS R AND D STRATEGY, POLICIES, MAJOR EFFORTS**

C. AMALRIC *In its West Europe Rept.: Sci. and Technol. No. 157 (JPRS-84434) p 19-36 29 Sep. 1984 Transl. into ENGLISH from Lusine Nouvelle (Paris), 30 Jun. 1983 p 62-69*

Avail: NTIS HC A04/MF A01

The Philips corporation's research and development strategy, policies and major efforts are described. Fluorescent lights, the electric razor, the magnetic cassette and the compact disc were all invented by Philips. This research has been extended by a very strong development policy.

B.W.

N84-34716# European Space Agency, Paris (France).

ESA AND ITS PROGRAMS: PRESENT AND FUTURE

E. MALLETT *In its Space Laser Appl. and Technol. (SPLAT) 3 p May 1984*

Avail: NTIS HC A14/MF A01

The ESA telecommunications, rendezvous and docking, meteorological, remote sensing, climatology and geodesy laser applications programs are outlined.

Author (ESA)

N84-34717# European Space Agency. European Space Research and Technology Center, ESTEC, Noordwijk (Netherlands).

THE ESA TECHNOLOGICAL RESEARCH PROGRAMS

M. TRELLA *In ESA Space Laser Appl. and Technol. (SPLAT) 4 p May 1984*

Avail: NTIS HC A14/MF A01

Funding, decision making, and research management aspects of ESA's technology program are introduced.

Author (ESA)

07

ECONOMICS, COSTS AND MARKETS

Includes Costs and Cost Analysis, Cost Control and Cost Effectiveness, Productivity and Efficiency, Economics and Trade, Financial Management and Finance, Investments, Value and Risk (Monetary), Budgets and Budgeting, Marketing and Market Research, Consumerism, Purchasing, Sales, Commercialization, Competition, Accounting.

A84-10029#

IMPLEMENTING SOFTWARE PRODUCTIVITY MEASURES

R. M. POSTON (Programming Environments, Inc., Ocean, NJ) *IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, Aug. 1983, p. 192-196. (AIAA PAPER 83-2360)*

An ongoing program to increase the productivity of software programmers is characterized, and some preliminary results are given. The dominance of salaries in the cost of producing software is pointed out, and the difficulty of measuring productivity is discussed. In the case presented, productivity is defined as the ratio of total software output to total input in labor and capital costs and measured at the project level. The improvement program comprises management policies, techniques, standards and metrics, tools, and training. The training courses, which necessarily involved diverting key personnel from projects and encountered passive resistance (even from engineers who participated in planning the program), presented some obstacles which have not yet been fully overcome. After two years, the projects in which the program has been implemented show about 25-percent lower labor costs, and it is projected that deliverable source instructions

can ultimately be increased from about 5.66 to 18-24 per staff day.

T.K.

A84-11739#

COMMERCIAL COMMUNICATIONS SATELLITE MARKET AND TECHNOLOGY IN THE 90'S

R. T. FILEP (Communications 21 Corp., Redondo Beach, CA) *International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct. 10-15, 1983. 6 p. refs (IAF PAPER 83-86)*

A description is presented of a user requirement study which was conducted during the fall of 1982 to determine possible commercial communications missions for a low-earth orbit space station under consideration for the 1990s. The study included a review of the literature on large space structures for communications. The survey returns were grouped into four categories, taking into account missions relating to testing, space communications technology, scientific research priorities and suggestions for cost savings in space, and communications traffic growth. In discussions regarding the space station, of considerable interest to many of the participants was the concept of the space station as a 'service station-in-the-sky'. Some interest was expressed in a low-earth orbit communications satellite.

G.R.

A84-15215

RELIABILITY COST ESTIMATION - MANAGERIAL PERSPECTIVES

T. L. REGULINSKI (Goodyear Aerospace Corp., Goodyear, AZ) and Y. P. GUPTA (Manitoba, University, Winnipeg, Canada) *IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 276-281. refs*

This paper deals with selected sources of uncertainties associated with the reliability related life cycle costs (LCC). Some of the factors responsible for uncertainty in reliability cost estimation are identified and discussed. A practical approach to the use of Beta distribution in estimating the reliability-related costs within the LCC framework is detailed, and is illustrated using a hypothetical example. Improved estimation of reliability related LCC requires better understanding of sources of associated uncertainties and the methods of dealing explicitly with them. Numerous distributions can be used for modeling of cost variates besides the Beta demonstrated in this paper. The 3-parameter Weibull and Gamma distributions are two examples. Whichever distribution is chosen, given a sufficiently large cost data base, it is essential to test the cost variate for goodness of fit and to validate the model by appropriate test of hypothesis. However, in estimation of costs involving large capital expenditure over a period of years, the data base is not likely to be large. Lacking, then, a statistically significant sample which would allow testing for the underlying probability distribution governing the cost variate, modeling via the Beta or other appropriate distribution presents a practical alternative.

Author

A84-15315

THE ESTABLISHMENT OF PRICES AND COSTS [ETABLISSEMENT DES PRIX ET DES COUTS]

R. DANDEU (Centre National d'Etudes Spatiales, Evry, Essonne, France) *IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings. Toulouse, Cepadues-Editions, 1983, p. 411-426. In French.*

An examination of techniques for establishing the price and costs of work which has to be contracted is presented, together with methods the client can use to assess, control, and discuss the costs and prices. Price is a monetary expression of the value of the transaction, while cost is the accumulation of charges and can be determined at any stage of the work. The costs can be set prior, during, or after the work is completed. The costs are a concern of management, which depends on information provided by the separate services performing the tasks either in concert or alone. Interim budget reports and projections are needed, as are comparisons with cost goals. An analytical accounting plan has been devised for cost management and is adaptable for any enterprise of any size, geographic dispersal, organic structure,

professional branch, and degree of integration. Details of the plan are provided, including terminology, analysis steps, and techniques for assigning value. M.S.K.

A84-15316

COST ESTIMATION AND ESTIMATE ANALYSIS [ESTIMATION DES PRIX ET ANALYSE DES DEVIS]

M. F. GALZIN (Centre National d'Etudes Spatiales, Toulouse, France) IN: Management of large space projects; Course on space technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 427-448. In French. refs

Industrial estimation of total costs for contractual participation in a space project is examined, noting the dependence of the cost estimates on analytical models. Early estimates are performed quickly and without excessive detail, and must include a sensitivity analysis. The estimations are analyzed after contract bids are placed, and cost control measures are taken, together with modifications, in the course of the work. The project management issuing the contracts forms an estimate of the total cost from the individual estimates of different industrial concerns manufacturing the subsystems. The costs include the equipment, the management, tests, individual subsystem costs, and the system integration costs. Global, semi-global, parametric, analogical, and mixed price estimation methods are described, with examples taken from actual projects. Estimates are synthesized and distributed to financiers, who take into account the ranges over which the costs will vary, the distribution of the management tasks for the project, and the costs of the components involved in the product.

M.S.K.

A84-15317

THE RECORDING OF OUTLAYS AND THE PROJECTION OF COMPLETION [L'ENREGISTREMENT DES DEPENSES ET LA PROJECTION AACHEVEMENT]

P. FOUSSIER (Centre National d'Etudes Spatiales, Toulouse, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 449-517. In French. refs

Cost accounting during the progress of a project is detailed, together with techniques for projecting, at any point in the work, the expected final total cost of the enterprise. Attention is given to the particular case of a technical project, where accounting of a work in progress can be done by sampling techniques, which also support projections of the final overall cost. Problems due to delays are discussed, along with means for detecting when costs are deviating from projections. The projections of the final costs are noted to serve mainly for guiding decisions, i.e., for administrative purposes. Differences between the price bid and the final cost, plus interest on funds in the interim, are a matter of negotiation between the interested parties, and depend on the form of the contract, the addition of modifications, the power of the negotiating parties, and the competence and capabilities of the negotiators. M.S.K.

A84-15320

THE 'VALUE ANALYSIS' TOOL [L'OUTIL 'ANALYSE DE LA VALEUR']

M. J. CHEVALLIER (Centre National d'Etudes Spatiales, Toulouse, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 583-605. In French. refs

Value analysis techniques are presented for controlling costs, estimating costs over the length of a project, accounting for different types of products, and assigning responsibilities for estimating costs. Costs are initially larger than the worth of the total product produced until volume production is achieved. Value analysis covers the definition of the system to be produced, the environment in which the product will be produced and used, the functional characteristics of the product to the user, the total number of the things that are needed, the effect the product will have on the

milieu in which it is deployed, and the constraints on the designer of the product. Value analysis proceeds from study orientation to research, to analysis of costs and functions, research on solutions, and study and evaluation of the solutions. A tentative balance sheet is generated, recommendation(s) of the choice(s) are made, and the project is followed through to realization. M.S.K.

A84-15321

FINANCING LARGE SPACE PROJECTS [LE FINANCEMENT DES GRANDS PROJETS SPATIAUX]

M. E. LEVY (Paris, Banque Nationale, Paris, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 609-623. In French.

The arrangement possible for financing large space projects are explored, together with various projects which can be undertaken. The scale of financing is noted to be on the order already experienced with petroleum, nuclear, natural gas production and utilization facilities, the Airbus program, and international gas pipelines. The projects depend on volume, time to operational status, the novelty, international aspect, and the risks. Participants in the venture comprise the promoter, the financiers, the public authorities, and the clients. Financing plans include normal credit channels, taking into account the associated risks and necessary advances for capitalization, loans, credit-leasing arrangements, and through concessions. Proposed and operational projects for which the financing is necessary include the Ariane, the SPOT satellite, Spacelab, DBS satellites, and astronomical satellites. M.S.K.

A84-15323

COST/SCHEDULE CONTROLS ON MAJOR U.S. DEFENSE PROJECTS

J. S. BAUMGARTNER (Defense Systems Management College, Fort Belvoir, VA) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings . Toulouse, Cepadues-Editions, 1983, p. 707-747.

The application of the cost/schedule-control-criteria (C/SCC) system to the management of U.S. defense and aerospace development contracts is reviewed. The history of C/SCC implementation is traced, and it is pointed out that many contractors have voluntarily adopted C/SCC because of their advantages in providing clear, objective insight into the progress being made for the money spent. The 35 criteria (grouped in the categories organization, planning and budgeting, accounting, analysis, and revisions and access to data) are included in an appendix, and numerous examples are illustrated with graphs and charts. The importance of the earned-value concept is stressed, and recommendations for C/SCC implementation are given. T.K.

A84-17063#

SHOULD THERE BE A MORTGAGE CONVENTION FOR SPACE ACTIVITY INVESTORS?

J. T. STEWART, JR. (FAA, Washington, DC) IN: Colloquium on the Law of Outer Space, 25th, Paris, France, September 27-October 2, 1982, Proceedings . New York, American Institute of Aeronautics and Astronautics, 1983, p. 251-259. refs (IAF PAPER 82-IISL-52)

Private sector activity and interest in outer space is increasing. Launch vehicles and launch operations are already attracting private capital investment. Space transportation systems are being eyed by private entrepreneurs. Use of outer space and celestial bodies for private profit oriented ventures are being imagined. The communications industry is already in space. Others are likely to follow. Private space activity will require private financing. Private financing will raise questions relating to creditors' rights and security interests. Some aspects of this emerging area of concern in the context of the aviation environment are discussed. Particular attention is given to the existence of some municipal law regimes and norms as they relate to aviation and attention is drawn to the so-called 'Mortgage Convention' relating to rights in aircraft. While not suggesting any particular path to follow in addressing security interests in space launch vehicles, it is suggested that the time

07 ECONOMICS, COSTS AND MARKETS

has come to at least start focusing on problems and solutions - perhaps drawing upon past experience in aviation. Author

A84-20599

THE 'AFFORDABLE' FIGHTER MARKET

B. WANSTALL *Interavia* (ISSN 0020-5168), vol. 39, Jan. 1984, p. 23-26.

The 'affordability' of the range of fighter aircraft types from cannon-armed advanced trainers to missile-armed, specialized interceptors depends on a country's size, wealth, the international significance of its resources, and the perceived threat. Attention is presently given to the fighter aircraft that are currently available for export in the \$5-15 million price range. The low price end of the market encompasses such Soviet-built aircraft as the MiG-21 variants and the Western Hawk 60, Alpha Jet and AMX. The high price aircraft available include the F-16 and Mirage 2000. The JAS39 Gripen and IAI Lavi, currently under development, are also intended for export. The F-20, a Mach 2-capable development of the highly successful F-5 export series aircraft, is expected to be an attractive choice for air forces contemplating a medium price (\$10 million) multirole fighter. O.C.

A84-21482

FINANCING A SOLAR POWER SATELLITE PROJECT

C. A. S. FAWCETT (Morgan Grenfell and Co., Ltd., London, England) (United Nations, Symposium on Solar Energy from Space, Vienna, Austria, Aug. 9-21, 1982) *Space Solar Power Review* (ISSN 0191-9067), vol. 4, no. 1-2, 1983, p. 71-77.

It is pointed out that the solar power satellite project constitutes a unique financial challenge because it represents the first attempt to exploit extraterrestrial sources commercially. This project is to make electricity available to all nations from sources which are outside the claim of any nation. This transnational character of the project and, in addition, the magnitude of the project costs, point to the desirability and the need for international funding. A technique known as 'project financing' has been developed in the world's financial community specifically for the purpose of funding such very large ventures. Attention is given to details of project financing, the completion risk, the completion agreement, the economic risk (technological risk), aspects of equity, questions regarding the debt, and the United Nations revolving fund for natural resources exploration. G.R.

A84-24448

SOFTWARE ENGINEERING ECONOMICS

B. W. BOEHM (TRW, Inc., Software Information, Systems Div., Redondo Beach, CA) *IEEE Transactions on Software Engineering* (ISSN 0098-5589), vol. SE-10, Jan. 1984, p. 4-21. refs

This paper summarizes the current state of the art and recent trends in software engineering economics. It provides an overview of economic analysis techniques and their applicability to software engineering and management. It surveys the field of software cost estimation, including the major estimation techniques available, the state of the art in algorithmic cost models, and the outstanding research issues in software cost estimation. Author

A84-25192#

ANALYSIS OF THE INFLUENCE OF THE LOAD FACTOR IN PLANNING AIRCRAFT TRANSPORT CAPACITY [ANALISI DELL'INFLUENZA DEL COEFFICIENTE DI RIEMPIMENTO IN FASE DI IMPOSTAZIONE DELLA CAPACITA' TRASPORTO DEI VELIVOLI]

G. GUERRA (Torino, Politecnico, Turin, Italy) *Ingegneria* (ISSN 0035-6263), Nov.-Dec. 1983, p. 309-320. In Italian. refs

A mathematical model of the factors affecting the profitability of passenger/transport aircraft in commercial-airline operation is developed and applied to sample aircraft of the 20-50-passenger class. The break-even load factor is defined as the ratio of payload (passengers, cargo, and mail) to capacity at which income covers the direct operating costs for a given flight. Since the direct operating costs in these aircraft are practically independent of load factor, load factor becomes the key parameter determining the margin (to be applied to indirect operating costs) and profit

obtainable with a given aircraft on a particular route. Hence in choosing an aircraft capacity, airline management must balance the greater efficiency of larger aircraft with the potential risk of low load factors. Numerous graphs of the principal parameter relationships and a table of aircraft characteristics are provided. T.K.

A84-29881

CONTEMPORARY BUSINESS OUTLOOK FOR LARGE SPACE VENTURES FINANCING, MANAGEMENT, CONSTRUCTION

T. B. HAWLEY (George Washington University, Washington, DC) IN: *Space manufacturing 1983; Proceedings of the Sixth Conference, Princeton, NJ, May 9-12, 1983*. San Diego, CA, Univelt, Inc., 1983, p. 405-412. refs (AAS PAPER 83-242)

This paper discusses the outlook for privately financed, managed and constructed large space ventures within the confines of today's free-market business infrastructure. The characteristics of earth-based macroprojects are outlined and shown to parallel the requirements of a proposed large space venture scenario. By focusing on two existing corporations and their relevant macroproject experiences, the paper formulates an existence proof which suggests that a large space venture could be handled with success by contemporary private businesses. Author

A84-29882

THE ECONOMICS OF SPACE MANUFACTURING - SOME FUNDAMENTAL PROPOSITIONS

A. G. VICAS (McGill University, Montreal, Canada) IN: *Space manufacturing 1983; Proceedings of the Sixth Conference, Princeton, NJ, May 9-12, 1983*. San Diego, CA, Univelt, Inc., 1983, p. 413-419. refs (AAS PAPER 83-243)

The paper examines the rationale of market failure to provide an optimal development of space manufacturing, and the consequent need for public intervention. The optimum development of space manufacturing is formally modeled as a problem of allocating terrestrial resources to an activity with an uncertain payoff. Two sources of market failure are examined: the lack of markets for certain types of risks and the public-goods nature of technical knowledge. Author

A84-29883

INTERNATIONAL COMPETITION IN COMMERCIAL AEROSPACE MARKETS

A. M. DEERING (Johnson and Higgins, New York, NY) and W. A. GOOD (Earth Space Transport Systems Corp., New York, NY) IN: *Space manufacturing 1983; Proceedings of the Sixth Conference, Princeton, NJ, May 9-12, 1983*. San Diego, CA, Univelt, Inc., 1983, p. 421-430. refs (AAS PAPER 83-244)

The U.S. has not approached the subject of space commerce in a way which takes the best advantage of its competitive free enterprise system. Many lessons can be learned by closely examining the relationship between government and entrepreneurs in the early days of air commerce. A review of recent international trends in commercial space technology shows that the U.S. is not maintaining the technological leadership to which it is committed due to a suboptimal government/industry relationship vis a vis other industrialized nations. Author

A84-29885

ENCOURAGING BUSINESS VENTURES IN SPACE TECHNOLOGIES

E. H. KLOMAN (National Academy of Public Administration, Washington, DC) IN: *Space manufacturing 1983; Proceedings of the Sixth Conference, Princeton, NJ, May 9-12, 1983*. San Diego, CA, Univelt, Inc., 1983, p. 441-444. (AAS PAPER 83-246)

The principal findings and recommendations of a report by a Panel of the National Academy of Public Administration that was released on May 3, 1983 are summarized. Policies and initiatives for adoption by NASA to encourage business ventures in space

technologies include: (1) Declare and institutionalize a major commitment to the commercialization of space technology; (2) assist industry in pursuing opportunities for profitable investment in space; (3) offer NASA facilities and services for use by private companies under conditions that encourage commercial development; (4) continue R&D including study of long-range opportunities; and (5) reduce the risks and restrictions that impede commercial exploitation of space technologies. J.N.

A84-30646#

COST ESTIMATION OF RESEARCH AND DEVELOPMENT PROJECTS

T. HINTON (FMC Corp., San Jose, CA) and D. D. MORAN (David W. Taylor Naval Ship Research and Development Center, Bethesda, MD) American Society of Mechanical Engineers, Winter Annual Meeting, Boston, MA, Nov. 13-18, 1983. 4 p. (ASME PAPER 83-WA/MGT-4)

The development of good cost estimates for R&D projects depends on the ability to define the tasks that must be performed and the results expected from R&D. The first step then is to define the project and the options and alternatives which are available. The next step would be to define the schedules for the accomplishment and ordering the tasks necessary to complete within schedule. The third step is to quantify the facilities, tooling, subcontract support, personnel, etc., necessary to accomplish the project, then the costs must be quantified. The final step is to identify and quantify risk and consolidate the estimate. This paper defines the steps which the authors feel necessary to put together a creditable cost estimate for an R&D project. Author

A84-31794

THE USE OF MICROCOMPUTERS FOR PLANNED MARKETING [KLEINRECHNEREINSATZ ZUR GESCHAFTSPLANUNG]

G. KAELEBERER (Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn, West Germany) Zeitschrift fuer wirtschaftliche Fertigung (ISSN 0044-3743), vol. 78, no. 8, 1983, p. 357-359. In German. (MBB-UA-703-83-OE)

The results of applying a microcomputer to rationalize the production process from the contracting state through production, marketing, and long-term planning are summarized. Planning costs have been rationalized to the extent that they were amortized within one year. Error-free and reproducible planning is attainable in the briefest times using a microcomputer. C.D.

A84-34770

RISK MANAGEMENT - A NECESSARY TOOL FOR SATELLITE OWNERS AND USERS

K. J. CHRISTEL (Western Union Telegraph Co., Upper Saddle River, NJ) Space Communication and Broadcasting (ISSN 0167-9368), vol. 2, March 1984, p. 47-57.

The process of risk management comprises four basic steps: identification, evaluation, control, and financing. Each of these techniques, or steps, is described, and it is shown how they apply to risks faced by satellite owners and users. It is stressed that insurance is not a panacea for the hazards faced in owning and operating a satellite. When properly employed, the methods of risk management will enable an organization to protect itself against the financial impact from them at the lowest cost. It is therefore important for the risk manager to identify and evaluate all such loss exposures in order to control and/or finance them at the lowest cost. What is more, any insurance policy that is purchased must be carefully worded to make sure that it covers exactly what the organization is intending to cover. C.R.

A84-37900

THE TECHNICAL AND ECONOMIC CONSIDERATIONS OF BRINGING SATELLITE COMMUNICATIONS TO SMALL MOBILE USERS

P. ANSON (Marconi Space and Defence Systems, Ltd., Portsmouth, England) and E. K. CROMPTON Radio and Electronic Engineer (ISSN 0033-7722), vol. 54, May 1984, p. 215-218.

The potential market presented by small users is considered and the characteristics of the present systems of communication

satellites are reviewed. The satellite parameters of antenna gain and directivity and of bandwidth are then discussed and the operational considerations of the existing satellites are examined with reference to the requirements of the proposed small mobile users. The implications of economic tariffs are briefly touched upon. Author

A84-38947

THE PRACTICAL DIMENSIONS OF SPACE

S. RAMO (TRW, Inc., Arlington, VA) IN: The first 25 years in space; Proceedings of the Symposium, Washington, DC, October 14, 1982. Washington, DC, Smithsonian Institution Press, 1983, p. 51-71; Comments, p. 72-78; Discussion, p. 79-82.

Attention is given to the gradual development of commercial priorities in U.S. space research, as well as to current possibilities for manned spacecraft industrial development, whose testbed will be the NASA Space Shuttle. Also noted is the range of economically advantageous uses to which unmanned spacecraft have been put (TV relay, telephony, navigation, weather prediction, and earth resources surveying), and the form that such commercially profitable technologies may take in the near future. The relative importance of 'free enterprise' initiatives in prospective space projects is also discussed, with a view to establishing the balance between government and private industry roles in space. Landsat management illustrates the problems implicit in these fundamental policy questions. O.C.

A84-46348#

AN INNOVATIVE APPROACH TO SUPPLIER COST CONTROL

J. M. ROSEN (Sikorsky Aircraft, Stratford, CT) IN: American Helicopter Society, Annual Forum, 39th, St. Louis, MO, May 9-11, 1983, Proceedings. Alexandria, VA, American Helicopter Society, 1984, p. 234-239. refs

Important management concerns of today can be described by the concepts of productivity and affordability. The present investigation is concerned with an innovative approach which is being used by an American aircraft manufacturer to improve affordability of its products by stimulating productivity improvements via cost reductions in product materials obtained from suppliers. The analysis of 54 supplier visits, and over 1000 proposed cost savings ideas, provides a reasonable base of data for the formulation of conclusions regarding a 'Producibility/Should Cost' program. It is found that supplier's personnel do have a wealth of cost savings ideas which can be tapped by an affirmative program. G.R.

A84-49145#

NEW OPPORTUNITIES FOR THE PRIVATE SECTOR IN SPACE TECHNOLOGY

W. D. CARTER and A. B. PARK (Globex, Inc., Reston, VA) IN: Satellite land remote sensing advancements for the eighties; Proceedings of the Eighth Pecora Symposium, Sioux Falls, SD, October 4-7, 1983. Sioux Falls, SD, Augustana College, 1984, p. 217-225. refs

The proposed transfer of the Landsat operational system to the private sector is certain to create many new opportunities, and a few problems, for those entrepreneurs willing to invest in the future of this program. While there is vigorous conflict of opinions over the worth of the program, we believe the assets of the program are unique in several respects. First, no other resource of the federal government can acquire the same objective information about the natural resources of the earth. Second, the revenue potential of the sale of the data is orders of magnitude smaller than the revenue potential of resource investment decisions enabled by early access to the raw data. Third, we find it ironic that because the system was designed and administered jointly by and for the resource agencies of the government, it has become an albatross around the neck of the single 'responsible' agency. If logic were used as a criterion, the program was a model of how to conduct cost-effective research in the government. This paper discusses alternative strategies and opportunities for private sector involvement. Author

07 ECONOMICS, COSTS AND MARKETS

A84-49413

PROGRAMS DESIGNED TO HELP SMALL BUSINESSES COMMERCIALIZE DEVICES INVENTED BY NASA, DOD, AND OTHER FEDERAL AGENCIES - A CASE HISTORY

R. C. DREW (Viking Instruments Corp., Great Falls, VA) IEEE Transactions on Instrumentation and Measurement (ISSN 0018-9456), vol. IM-33, Sept. 1984, p. 230-233.

The U.S. Government's Small Business Innovation Development Act of 1982 established the Small Businesses Innovation Research (SBIR) program, which has as its objective the promotion of innovation in high-tech areas through direct Government funding of research conducted by businesses with less than 500 employees. SBIR will thereby complement the alternative mechanisms of private capitalization, providing incentives at the feasibility study, testing, and concept-development stages of a prospective product. Other programs of similar intent have been conducted by NASA, the U.S. Department of Defense, the Atomic Energy Commission, and the National Science Foundation. Attention is given to a case study concerning the early development phase of a novel family of analytical instruments based on patented mass spectrometer technology. O.C.

N84-10108# Committee on Science and Technology (U. S. House).

SPACE COMMERCIALIZATION

Washington GPO 1983 388 p Hearings before the Subcomm. on Space Sci. and Appl. of the Comm. on Sci. and Technol., 98th Congr., 1st Sess., no. 23, 3 4, 17, 18 May 1983 (GPO-22-870) Avail: Subcommittee on Space Science and Applications

The development of opportunities for the American free enterprise system to use space for a variety of applications and technologies is discussed in an effort to assure that the private sector is free to organize and operate for profit in the space environment. The requirements of a policy framework conducive to business ventures based on space technologies are discussed as well as the relationships between the public and private sectors in the commercial utilization of space. A.R.H.

N84-10349# Joint Publications Research Service, Arlington, Va. TRADE AGREEMENTS ON KNOW-HOW DISCUSSED

A. MELNIKOV *In its USSR Rept.: Sci. and Technol.*, No. 19 (JPRS-84497) p 1-5 7 Oct. 1983 Transl. into ENGLISH from Khozyaystvo i Pravo (Moscow), no. 6, Jun. 1983 p 72-74 Avail: NTIS HC A06

Under the conditions of the present scientific and technical revolution the thirst for possessing advanced production experience and knowledge has led to a significant increase in the number of agreements on the transmission of know-how as compared with license agreements, whose objects are patented scientific and technical achievements. As a rule, the All-Union Litsenzintorg Association concludes agreements on the transmission of know-how in the USSR. A number of other foreign trade associations also conclude such agreements. In accordance with their charters operations are performed for the transmission of know-how, when the latter form an integral part of agreements on the export or import of goods based on the products list of these associations. An analysis of the terms of agreements on the transmission of know-how shows that the rights and duties of the parties to the agreement coincide in large measure with the rights and duties of the licensor and licensee according to the license agreement. Author

N84-12773# Stanford Univ., Calif. Center for Research on Organizational Efficiency.

SEARCH AMONG QUEUES

A. GLAZER and R. HASSIN Jun. 1983 22 p (Contract N00014-79-C-0685) (AD-A131639; SU-TR-406) Avail: NTIS HCA02/MFA01 CSCL 12A

Customers must often wait to obtain some service or goods, the wait usually being longer the greater the total number of persons who have yet to be served. This phenomenon is especially common

in transportation markets, such as the trucking, household moving, and bus industries. Nor is it unknown for customers to have to wait for the services of accountants, lawyers, dentists, physicians, and, most importantly, plumbers. When for some reason shortages occur, rationing is often accomplished by queuing; new models of automobiles and computers have lately been subject to such shortages. Recent research has shown that explanations of market behavior should incorporate customer's aversion to such waiting. The fundamental idea is that a customer who arrives at some facility and finds a long queue may find it worthwhile to balk, incur some search cost, and find a shorter queue at some other facility. This in turn means that excess capacity may result not from oligopoly of inefficiencies, but from a socially beneficial effort to reduce consumers' waiting costs. GRA

N84-14697# Umgeni Water Board, Pietermaritzburg (South Africa).

INTEGRATED BUDGET CONTROL USING A DESKTOP COMPUTER

R. F. PHELINES and A. E. CARLISLE *In South African Inst. of Civil Engineers Symp. on Computers in Construction* 15 p 1982

Avail: NTIS HC A08/MF A01

A computerized accounting system enabling management to monitor income and expenditure on cost heads against monthly budget is described. The handling of planning expenses, the distribution of overheads, the inclusion of unpaid financial commitments and the distribution of interest accrued on monies loaned but not allocated, allow realistic costs to be determined for each selected cost head and for variances against budget to be identified. The system is flexible and can be adapted to accommodate any details of monthly income and expenditure which management wishes to identify. M.G.

N84-14699# California Univ., Berkeley.

INTEGRATED BID ESTIMATE SYSTEMS FOR CONTRACTORS

R. A. APPUHN *In South African Inst. of Civil Engineers Symp. on Computers in Construction* 9 p 1982

Avail: NTIS HC A08/MF A01

An integrated bid estimating system which is designed for use either on medium or large interactive or data based systems is described. The basic parameters on which the bid estimate is based and the method by which resources are defined and utilized for the preparation of the bid estimate are discussed. The information thus obtained may then be merged into a larger and more general integrated information system for effective project management. M.G.

N84-14967# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

LIFE CYCLE COSTING IN A DYNAMIC ENVIRONMENT Ph.D. Thesis

J. A. LONG 1983 202 p (AD-A133023; AFIT/CI/NR-83-26D) Avail: NTIS HCA10/MFA01 CSCL 05A

The consideration of life cycle cost is a major part of the Department of Defense management strategy to control the increasing cost of defense systems. It includes the cost of research and development, production, operating and support, and disposal. Unfortunately, due to a lack of credibility, life cycle costing has not reached its full potential. In an attempt to rectify the situation, this research centers on life cycle costing in a dynamic environment. This examination is from the three perspectives: methodology, modeling, and application. The chapter on methodology is a critical examination of Air Force life cycle costing in the acquisition of new aeronautical systems. It contains recommendations for reorganization and revision of current business practices. The chapter on modeling reviews various models and methods for risk analysis including Monte Carlo simulations, additive and multiplicative moments, sums and products of random variables, and transform techniques. The chapter on application demonstrates the feasibility of using the various models and methods under a realistic scenario for systems acquisition. GRA

N84-15165*# Brown (W. S.), Inc., Salt Lake City, Utah.
COMMERCIALIZATION OF OPPORTUNITIES FOR MATERIALS PROCESSING IN LOW GRAVITY Final Report

W. S. BROWN and S. R. NIXON 13 Jun. 1983 35 p
 (Contract NAS8-34901)
 (NASA-CR-170953; NAS 1.26:170953) Avail: NTIS HC A03/MF A01 CSCL 22A

Business infrastructure required to achieve commercial MPS, incentives and disincentives for MPS, NASA/industry working agreements, small business innovation, NASA/industry agreements, joint venture agreements, and commercial spinoffs are addressed. Author

N84-16801# Naval Personnel Research and Development Center, San Diego, Calif.

PRODUCTIVITY IMPROVEMENT IN A PURCHASE DIVISION: EVALUATION OF A PERFORMANCE CONTINGENT REWARD SYSTEM (PCRS) Final Report, 1979 - 1981

D. M. NEBEKER, B. M. NEUBERGER, and V. N. HULTON Sep. 1983 76 p
 (AD-A133589; NPRDC-TR-83-34) Avail: NTIS HCA05/MFA01 CSCL 05I

Performance contingent reward systems (PCRSs) were developed for small purchase buyers and supply clerks in a purchase division of a naval shipyard supply department. The rewards were financial incentives provided to individual civil service employees performing above standard. Description of the system and an evaluation of its effectiveness in increasing productivity and saving costs are provided. Results showed that systems increased productivity substantially and were cost effective.

GRA

N84-17194# Committee on Science and Technology (U. S. House).

SPACE COMMERCIALIZATION

G. A. SMITH Washington, D.C. GPO 1983 39 p Rept. presented by the Subcomm. on Space Sci. and Appl. of the Comm. on Sci. and Technol., 98th Congr., 1st Sess., Oct. 1983 (GPO-26-498) Avail: Subcommittee on Space Science and Applications

The results of four space commercialization hearings held by the Subcommittee on Space Science and Applications in May, 1983 are presented. The broad topics that characterize space commercial ventures, and the need for any institutional and organizational changes in order to encourage commercialization are addressed. The commercialization of launch vehicles is discussed. Author

N84-18092# Logistics Management Inst., Washington, D. C.
A STRATEGY FOR IMPROVING OVERHEAD COST CONTROL
 R. S. YOUNG and P. R. MCCLENON Apr. 1983 22 p
 (Contract MDA903-81-C-0166)
 (AD-A134661; LMI-NA302) Avail: NTIS HC A02/MF A01 CSCL 14A

NAVAIR negotiators have few tools to use when forecasting and negotiating overhead costs to be included in noncompetitive contracts. This study outlines a strategy of organizational changes, educational programs, research efforts and policy initiatives to provide improvements in NAVAIR's ability to deal with this significant cost element. Author (GRA)

N84-18158# Management Consulting and Research, Inc., Falls Church, Va.

US MILITARY AIRCRAFT COST HANDBOOK Final Technical Report

W. E. DEPUY, JR., R. MOYER, P. R. PALMER, JR., B. J. MCKINNEY, G. R. KREISEL, S. J. BALUT, and G. R. MCNICHOLS 1 Mar. 1983 507 p Prepared for The Analytic Sciences Corp.

(Contract MDA903-78-C-0294)

(AD-A136035; TASC-TR-8203-1) Avail: NTIS HC A22/MF A01 CSCL 01C

Management Consulting & Research, Inc. (MCR) collected data on the Total Obligational Authority (TOA) requested by the Army, Navy and Air Force to procure attack, bomber and fighter, fixed and rotary wing aircraft. The TOA was normalized to base fiscal year 1981 dollars. Lot average, cumulate average and unit costs were calculated for Airframe, Airframe and Engine on total flyaway cost where available. Data is presented for 128 Mission/Design/Series (MDS) aircraft. Author (GRA)

N84-20247# Mitre Corp., Bedford, Mass.

SOFTWARE ACQUISITION RESOURCE EXPENDITURE (SARE) DATA COLLECTION METHODOLOGY Final Report

R. L. DUMAS Hanscom AFB, Mass. ESD Dec. 1983 136 p
 (Contract F19628-82-C-0001)

(AD-A137084; MTR-9031; ESD-TR-83-214) Avail: NTIS HC A07/MF A01 CSCL 09B

One of the major shortfalls in software cost estimation is the lack of a well-defined, well-structured database. This report is the culmination of a multi-year effort to develop contractual documents to effect quality software data collection on defense programs. It includes as attachments a proposed draft military standard for software work breakdown structures and a data item description for reporting project attributes that impact software cost and schedule. The evolution of the documents is discussed and procedures for implementing data collection on defense programs are provided. Readers are asked to comment on the SARE methodology using a questionnaire provided as the third attachment. Author (GRA)

N84-20444# Naval Postgraduate School, Monterey, Calif.

STATISTICAL MODELS FOR ESTIMATING OVERHEAD COSTS

D. C. BOGER Oct. 1983 45 p

(Contract F60-433)

(AD-A137351; NPS54-83-014) Avail: NTIS HC A03/MF A01 CSCL 12A

Five years of quarterly overhead costs at two major defense aircraft manufacturers were categorized according to the types of costs incurred. These categories of overhead costs were then modeled via regression analysis using production and operating data from the two contractors as independent variables. Adjustment for quarterly autocorrelation revealed excellent structural and predictive models of total overhead and labor-related overhead costs. Author (GRA)

N84-21122# Naval Research Lab., Washington, D. C. Computer Science and Systems Branch.

ACCURACY OF SOFTWARE DEVELOPMENT ACTIVITY DATA: THE SOFTWARE COST REDUCTION PROJECT Final Report, Jun. 1982 - Jun. 1983

L. J. CHMURA and A. F. NORCIO (U.S. Naval Academy) 30 Dec. 1983 31 p

(Contract RR0-1409-41)

(AD-A137639; NRL-8780) Avail: NTIS HC A03/MF A01 CSCL 09B

This report discusses the accuracy of self-reported programmer activity data and valid ways to analyze the data. We conducted a one-week experiment during which we sampled the activities of five software engineers working on the Software Cost Reduction (SCR) project at the Naval Research Laboratory. We compared the sampled data with activity data submitted 'as usual' by the five engineers on weekly activity reports. The results indicate that the engineers report relatively accurate with the activity report if

07 ECONOMICS, COSTS AND MARKETS

they make notes of their activity, or if they promptly submit their reports. If engineers do not keep notes of their activities, prompt reporting is critical to ensure the accuracy of reported data. The results also indicate that ratios between activity categories are valid metrics of project activity. Author (GRA)

N84-21437*# Terra-Mar, Mountain View, Calif.
ALTERNATIVE STRATEGIES FOR SPACE STATION FINANCING

D. C. WALKLET and A. T. HEENAN 1 Sep. 1983 33 p refs
(Contract NASW-3750)
(NASA-CR-175412; NAS 1.26:175412) Avail: NTIS HC A03/MF A01 CSCL 05C

The attributes of the proposed space station program are oriented toward research activities and technologies which generate long term benefits for mankind. Unless such technologies are deemed of national interest and thus are government funded, they must stand on their own in the market place. Therefore, the objectives of a United States space station should be based on commercial criteria; otherwise, such a project attracts no long term funding. There is encouraging evidence that some potential space station activities should generate revenues from shuttle related projects within the decade. Materials processing concepts as well as remote sensing indicate substantial potential. Furthermore, the economics and thus the commercial feasibility of such projects will be improved by the operating efficiencies available with an ongoing space station program. B.G.

N84-22287# National Aerospace Lab., Amsterdam (Netherlands). Informatics Div.

FUNCTIONAL REQUIREMENTS FOR THE DEVELOPMENT AND USE OF A SOFTWARE-COST DATABASE

G. J. DEKKER and F. J. VANDENBOSCH 28 Jan. 1983 35 p refs Submitted for publication
(Contract NIVR-1870)
(AD-B079998; NLR-MP-83009-U) Avail: NTIS HC A03/MF A01 CSCL 09B

The characteristics of a data base used to develop an accurate cost estimation method and to support cost management in software development are discussed. A cost estimation method based on project size, project difficulty, reliability requirements, utilization, percentage of new design and code, development environment, application, and human resources, with 47 well-defined cost factors is proposed. Author (ESA)

N84-22510# Yale Univ., New Haven, Conn.
FISCAL AND MONETARY POLICY IN A GENERAL EQUILIBRIUM MODEL

T. BEWLEY 27 Jan. 1984 92 p
(Contract N00014-77-C-0518; NSF SES-83-42754)
(AD-A138502; FOUNDATION-DISCUSSION-690) Avail: NTIS HC A05/MF A01 CSCL 12A

This is a theoretical study on monetary and fiscal policy in a general equilibrium model with rational expectations, with perfect markets for current goods, but with restrictions on borrowing and insurance and with a Clower constraint on payments. Fiscal actions are understood to be manipulations of taxes and subsidies. Monetary policy is understood to be the purchase and sale of government debt or control of the banking system's ability to lend. The main result of this paper, Theorem 4.1, may be misinterpreted as saying macroeconomics is easy. Here is a model in which phenomena resembling trade cycles may occur, and it is proved that policy may prevent them. Furthermore, the result is not at all surprising once one realizes that it is an analogue of the second welfare theorem. However, one should be aware that there are strong hypotheses underlying the model. These are that expectations are rational and that random changes of aggregate importance are revealed to everyone simultaneously. The latter assumption, of course, precludes the asymmetric information which underlies the so-called island models of macroeconomic theory.

GRA

N84-22511# General Accounting Office, Washington, D. C.
PROGRESS IN IMPROVING PROGRAM AND BUDGET INFORMATION FOR CONGRESSIONAL USE Annual Report
8 Nov. 1983 13 p
(AD-A137491; GAO/OACG-84-2) Avail: NTIS HC A02/MF A01 CSCL 05A

The annual report, submitted to the Congress in accordance with 31 U.S.C. 1113(e), summarizes progress in improving program and budget information for congressional use. The report discusses progress in such areas as cooperative work with DOD to improve their budget process; required information services provided by GAO; and continuing improvements by the executive branch. The report also discusses GAO's work on an improved financial management system for the Federal Government. Author (GRA)

N84-23301# Air Force Systems Command, Wright-Patterson AFB, Ohio.

MANAGING PROGRAM RISK: ONE WAY TO REDUCE COST GROWTH Final Report

L. COOPER In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 39-42 1983
(AD-P002754) Avail: NTIS HC A24/MF A01 CSCL 15E

Former Deputy Secretary of Defense, Frank C. Carlucci, in his 30 April 1981 memorandum on Improving the Acquisition Process recognized that the key to reducing program costs is to establish and maintain a stable program. One of his initiatives requires the Services to budget to most likely or expected costs, including predictable cost increases due to risk; and to provide incentives for acquisition officers and industry to make and use realistic cost estimates. This paper focuses on how the program manager can reduce cost growth through a Risk Management Program that provides a more complete assessment of program risks. The essential elements of a risk management program, a proposed approach to implementing the program, and the advantages associated with successful implementation on major weapon systems acquisitions are outlined. In summary, OSD has demonstrated a commitment to reducing cost growth. Success, however, will require the program managers to establish a risk management program that forces consideration of all program risks before they occur. Author (GRA)

N84-23304# University of Southern California, Los Angeles.
ASSUMPTION OF RISK IN THE R AND D ENVIRONMENT Final Report

J. H. GILL In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 60-63 1983
(AD-P002757) Avail: NTIS HC A24/MF A01 CSCL 15E

There has been a traditional philosophy regarding the use of different types of contracts to share risk during the development of a major weapon system. This philosophy would have the Government assume the burden of risk early in the life of the system through the use of Cost Type contracts. As the requirement becomes more defined, the burden of risk is gradually transferred to the contractor with a commensurate increase in potential profit. If we accept the premise that the Acquisition system requires improvement, what are the alternatives that may be considered to alter the process? A method that has been utilized by the Ballistic Missile Office has been to dramatically alter the traditional concept of assumption of risk by offering Contractors the opportunity to take their fate into their own hands and assume a major share of the cost risk while simultaneously reducing the risk associated with technical failure. GRA

N84-23314# Air Force Business Research Management Center, Wright-Patterson AFB, Ohio.

COST ACCOUNTING STANDARDS: A TIME FOR GOVERNMENT AND INDUSTRY ACTION Final Report

P. D. SULLIVAN In its Proc. of the Fed. Acquisition Res. Symp. with Theme p 112-117 1983
(AD-P002767) Avail: NTIS HC A24/MF A01 CSCL 15E

From its inception in 1970, the Cost Accounting Standards Board (CAS Board) was the subject of considerable controversy. In September 1980, Congress declined to continue funding of the

Board and it ceased operations. But the nineteen Standards promulgated by the Board continue today as a part of the law. Consequently government and industry alike have found themselves without an authoritative body to interpret the Standards and issue corrections, exemptions and waivers. This paper will examine the history of the Board, some of the current problems, and discuss several of the alternatives that are available at this time for dealing with the situation created by the demise of the Cost Accounting Standards Board. GRA

N84-23317# Logistics Management Inst., Washington, D. C.
ANALYSIS OF INCENTIVES FOR PRODUCTIVITY-ENHANCING INVESTMENT Final Report

G. GOTTSCHALK, M. G. MYERS, and M. J. KONVALINKA /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 130-134 1983 (AD-P002770) Avail: NTIS HC A24/MF A01 CSCL 15E

There is evidence that Government contractors perform production contracts using high-cost methods leading to higher than necessary prices to the Government. Capital investments which lower total cost of performance are discouraged or at least not encouraged by current policies and market environment. This paper describes a model of contractor investment behavior within existing DoD contracting principles. A preference for investments which confer low rates of productivity gain is shown to exist under current contracting policies. A discounted cash flow investment analysis model is used to explore a number of correctives to current policies including increased weight on facilities capital employed in Department of Defense (DoD) profit policy, sharing of cost savings, and investment incentives such as accelerated depreciation. Finally, the payoff to the Government and DoD if each corrective were adopted is explored. Author (GRA)

N84-23320# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

COMPETITIVE PROCUREMENTS: THE SYNERGISTIC LINKAGE AMONG GOVERNMENT, INDUSTRY AND ACADEME Final Report

D. L. BRECHTEL, E. J. BROST, and S. J. ZAMPARELLI /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 150-155 1983 (AD-P002773) Avail: NTIS HC A24/MF A01 CSCL 15E

Competition is looked upon by many as one technique to maximize the return from the procurement dollars available. Many members of Congress recommend the competitive method of purchasing for most Government procurement actions. However, the history of Federal procurement attests to the fact that competitive bidding is inadequate in some situations. Since competitive procurement does not always result in lower prices, program managers, contracting officers, and buyers should understand the conditions which may affect prices and aggressively seek competition for items that may likely result in net savings to the Government. This paper includes a summary of competition theory and recent research conducted in the area of competition by graduate students at the Air Force Institute of Technology (AFIT). Two graduate research projects that addressed competition for weapon system replenishment spare parts are summarized in the paper followed by some concluding observations. Author (GRA)

N84-23321# Air Force Systems Command, Wright-Patterson AFB, Ohio.

COMPETITION: AN INTEGRAL PART OF THE ACQUISITION PROCESS Final Report

R. C. HEAD /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 156-160 1983 (AD-P002774) Avail: NTIS HC A24/MF A01 CSCL 15E

The concept of competition for defense acquisition is one that requires careful examination and discussion in today's cost conscious environment. The Office of Management and Budget Circular A-109 directs each government agency to... depend on, whenever economically beneficial, competition between similar or

differing system concepts throughout the acquisition process. This direction leads to the current high level attention that competition is receiving today. Competition is being examined as a major factor in cost control for weapon system procurement for the entire acquisition process. The need for complete preplanning and market research to promote effective competition is apparent when past procurement efforts are examined. Preplanning and market research in the early stages of the acquisition process are areas that need active management support. Author (GRA)

N84-23328# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

COST RISK AND CONTRACT TYPE: A NORMATIVE MODEL Final Report

R. L. MURPHY /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 193-197 1983 (AD-P002781) Avail: NTIS HC A24/MF A01 CSCL 15E

This article presents a model which describes the relationships among the cost risk inherent in a particular procurement situation, the degree to which that cost risk is shared between the government and the contractor, and the risk premium awarded to the contractor for assuming his share of the cost risk. The model is normative in that it provides a framework for analyzing the possible combinations of risk assumption on the part of the government and risk premiums which are logically consistent. The model requires that the price analyst estimate the cost of contract performance, the general shape of the distribution of probable costs, and the standard deviation of that distribution. In addition, a policy decision is required concerning what constitutes a reasonable probability that the contractor would incur a loss. Author (GRA)

N84-23329# Air Force Armament Lab., Eglin AFB, Fla.

CONTRACTING INITIATIVE: BEST PROPOSAL FOR PRICE Final Report

B. ROSE /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 198-201 1983 (AD-P002782) Avail: NTIS HC A24/MF A01 CSCL 15E

With ever increasing emphasis being placed on Department of Defense acquisition improvements and reduction of acquisition lead time, the Air Force Systems Command, Armament Division, has developed and is testing a contracting initiative referred to as Best Proposal for Price. This concept is intended to significantly reduce efforts by government and contractor personnel and thereby reduce acquisition lead time while maintaining the integrity of competitions that are limited by funds. Best Proposal for Price contemplates award without negotiation, if possible. The main thrust of this acquisition concept is to identify the government's maximum contract dollar amount in the solicitation thus minimizing the negotiation processing time and yet insuring technical performance. Offering potential for improving present negotiation contracting procedures, the very nature and structure of Best Proposal for Price lends itself to some controversy. Nevertheless, Best Proposal for Price has the intrinsic momentum to be highly contributory in government contracting strategy. Author (GRA)

N84-23330# VTI, Inc., Dayton, Ohio.

A COST BASED ACQUISITION PLANNING MODEL UTILIZING EXPERT SYSTEM CONCEPTS Final Report

M. A. BUCCIARELLI and G. L. ROEDER /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 202-208 1983 (AD-P002783) Avail: NTIS HC A24/MF A01 CSCL 15E

A micro-processor based computer model utilizing expert system concepts has been developed to provide cost based acquisition planning information to the DoD acquisition community. The model, called ACROM, is a menu driven inquiry-response system wherein qualitative acquisition profile descriptions are converted, via embedded algorithms, to quantitative system acquisition cost estimates in a MIL-STD-881A Work Breakdown Structure format. The choice of one of two input modes provides for a top-down

07 ECONOMICS, COSTS AND MARKETS

(Mode A) estimate using only six high level input parameters or a bottom-up (Mode B) estimate by characterizing each of 45 WBS elements for the system acquisition. Estimates may be accumulated by subsystem for large scale programs or by phase for total program and/or life cycle cost estimates. The model has been exercised for over 70 DoD system acquisitions and has provided relatively accurate estimates for electronic computer-based systems. It is anticipated that continued use and enhancements of the model will improve the embedded expertise in specialized acquisition areas and will provide a readily accessible and easy to use program management support tool in the critical area of system cost.

Author (GRA)

N84-23334# Clemson Univ., S.C.

AN AUTOMATED AIRFRAME PRODUCTION COST MODEL Final Report

N. K. WOMER /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 222-228 1983

(AD-P002787) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper is dedicated to developing a better understanding of the factors and forces that determine weapons system cost during production. Here we report on a tool that provides timely estimates of the cost impacts of program policy decisions. This tool was developed from theoretical principles. The economists production function was incorporated into a model which addressed the realities of program management. The model uses the calculus of variations to include the production cost drivers of learning by doing, learning over time, the speed of the production line and production line length. It is estimated from data on the C-141 program and tested on other Air Force programs. This work is fully documented in Cost Functions for Airframe Production Programs a report prepared for the Air Force Business Research Management Center and the Office of Naval Research by Womer and Gullledge. This paper concentrates on the results and applications of that study.

Author (GRA)

N84-23335# PEL, Inc., Baton Rouge, La.

RISK ANALYSIS: COMPARING DIFFERENT CONTRACT TYPES Final Report

G. H. WORM /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 229-231 1983

(AD-P002788) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper presents a brief description of how the results from a cost risk analysis can be used to distribute the risk in a contract between the government and the contractor. The main contract types discussed are Firm Fixed Price (FFP) and Fixed Price Incentive (FPI). Other contract types may be structured around a risk analysis but are not discussed here.

GRA

N84-23339# Management Consulting and Research, Inc., Falls Church, Va.

THE PROBLEM OF COST GROWTH Final Report

G. R. MCNICHOLS and B. J. MCKINNEY /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 251-254 1983

(AD-P002792) Avail: NTIS HC A24/MF A01 CSCL 15E

There is a substantial amount of rhetoric on the subject of cost growth. Usually, we blame such growth on inflation. There are, in fact, several views on the reasons for cost growth or the measures used to calculate and present cost increases by weapon system. MCR has conducted studies of cost growth for many years. This particular paper will discuss the problem from an historical perspective, and present actual results from an analysis of the 31 December 1982 Selected Acquisition Reports (SARs).

GRA

N84-23340# Advanced Technology, Inc., Arlington, Va.

ECONOMIC PRODUCTION RATE STUDY Final Report

E. J. DOWNING, JR., G. E. ROESLER, and W. M. MCGOVERN /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 256-261 1983

(AD-P002793) Avail: NTIS HC A24/MF A01 CSCL 15E

The objective of this study is to give the Program Manager tools for use in discussing, planning and evaluating economic production rates. In order to deal with large scale, multi-tiered acquisition programs, a distinction must be made between procurement and production rate. The economic procurement rate refers to the rate of acquisition of the complete system, while the economic production rate addresses each component or contractor contributing to the system. The EPR is defined as that rate of procurement (or production) that permits efficient use of available industrial resources to achieve the lowest unit cost. Using a model suggested by John Bemis, this study examines the procurement profile of five major DoD acquisition programs--the Army's M-1 tank, Fighting Vehicle System and TOW missile, the Air Force's A-10 aircraft, and the navy's A-6E aircraft. The model can be expressed either graphically or as an exponential equation. The graphical form is especially useful when iso-unit cost lines are plotted on axes of production rate versus cumulative quantity. In this form it is possible to evaluate various procurement profiles of a system and draw some conclusions concerning their relative efficiencies. This analysis was done for each of the five systems, and savings from more economical rates are estimated.

GRA

N84-23341# Ohio State Univ., Columbus.

EXPERT SYSTEMS FOR PRICE ANALYSIS: A FEASIBILITY STUDY Final Report

J. F. DILLARD, K. RAMARKRISHNA, and B. CHANDRASEKARAN /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 270-274 1983

(Contract F33615-82-C-5114)

(AD-P002795) Avail: NTIS HC A24/MF A01 CSCL 15E

The feasibility of alternative designs for an expert price analysis computer system is evaluated by analyzing the price analysis task, and the related support requirements, as performed by Air Force procurement activities. Generally, the Air Force should embark on a coordinated, long-range program of providing adequate expert system support to all procurement functions. Initially, this support can best be provided by a highly structured, interactive expert system which confronts the system user with requisite decision sequences. Each sequence points to a tutorial network which provides explanation and instruction if desired. The most immediate benefit will be experienced at the base level where little expert assistance is currently available. This type of expert system provides the nucleus for developing more sophisticated expert systems for other procurement activities in the intermediate and long term.

Author (GRA)

N84-23342# Naval Postgraduate School, Monterey, Calif.

CONTRACTOR 'HUNGRIENESS' AND THE RELATIVE PROFITABILITY OF DOD BUSINESS Final Report

W. R. GREER, JR. and S. S. LIAO /in AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 275-279 1983

(AD-P002796) Avail: NTIS HC A24/MF A01 CSCL 15E

Lately, DoD-contractor profitability has been very much an issue. Some feel low profits may convert defense business into a market of last resort. Others allege defense contractors earn excessive profits. We address the contradiction between these viewpoints. Specifically, we examine data covering 20 years, and study how the profitability of DoD contracts is influenced. We ask how profitable contractors are in their DoD versus commercial business segments, and whether the risk levels faced are equivalent. Our conclusions are that Program Managers (PM's) take advantage of the bargaining power they hold to buy goods at substantially lower profit margins when capacity utilization is low. The returns earned by contractors on DoD business are measurably lower than the returns on commercial business during periods of low capacity

utilization. Also, the volatility of returns is higher for Dod business which means the risks are viewed by management as being somewhat higher. Author (GRA)

N84-23344# Ohio State Univ., Columbus.

AN INTELLIGENT MANUAL FOR PRICE ANALYSIS Final Report

K. RAMAKRISHNA, J. F. DILLARD, T. G. HARRISON, and B. CHANDRASEKARAN / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 284-290 1983 (Contract F33615-82-C-5114)

(AD-P002798) Avail: NTIS HC A24/MF A01 CSCL 15E

We investigated price analysis as performed in the United States Air Force (USAF) and the environment in which buyers at bases make decisions about procurement actions. Based on this study, we evaluated the intelligent manual approach for guiding a buyer through the decisions and actions necessary to conclude a buy. An intelligent manual is a computer-based consultant that provides advice and pointers on the use of existing information in response to user queries. Our prototype intelligent manual is constructed as part of the ZOG system. ZOG is an active, large-network, menu-selection system. We present the design of the interactive intelligent manual (based on our analysis of pricing) and discuss its short-term and long-term implications for procurement in the USAF. We identify how this system would be the basis for future intelligent, problem-solving expert systems that automate significant components of the pricing task. GRA

N84-23345# Delaware Univ., Newark.

ON 'BEFORE' AND 'AFTER' COST COMPARISONS Final Report

R. M. STARK / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 291-293 1983

(AD-P002799) Avail: NTIS HC A24/MF A01 CSCL 15E

Comparisons of a priori cost estimates with a posteriori payments is about as pervasive as it is instinctive. A new result of mathematical optimization and probability theories leads to the unexpected conclusion that such comparisons, even for many idealized engineering designs, appear to be invalid. The paper demonstrates that before and after costs are unit samples from populations with different probability distributions. GRA

N84-23346# Science Applications, Inc., McLean, Va.

COST REALISM: ASSURING MORE REALISTIC CONTRACTOR COST PROPOSALS Final Report

D. L. TRAPP / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 294-300 1983

(AD-P002800) Avail: NTIS HC A24/MF A01 CSCL 15E

Unrealism in Defense contractors' cost proposals, especially for RDT&E programs, often contributes to cost growth as well as to other problems. The Defense Department is therefore concerned with achieving greater cost realism. A methodology has been developed for achieving greater realism of contractor cost proposals. This methodology defines cost realism as an evaluation criterion stated in the solicitation which compares the offeror's proposed cost with a detailed Government estimate for each contractor and then scores of the degree of realism. The methodology constitutes a source selection cost evaluation process involving determination of cost evaluation factors; preparation of instructions to be included in the solicitation concerning the cost evaluation factors; preparation of Government estimates for each offeror; and scoring each offeror for cost realism and Government estimated cost. The methodology is a synthesis and improvement of the best techniques and procedures currently being used in source selection cost evaluation (especially those of NAVELEX).

Author (GRA)

N84-23356# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

LARGE FIRM EFFICIENCY, CONCENTRATION, AND PROFITABILITY IN DEFENSE MARKETS Final Report

R. F. ALLEN / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 356-362 1983

(AD-P002810) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper attempts to quantify the relative impacts of large firm efficiency and market power on profit margins in defense industries. The methodology employs a direct measure of firm efficiency together with a conventional measure of market power. Large firm efficiency and the effective use of market power appear to be generally present in industries characterized by decreasing costs. However, the basic defense industries - aircraft, missiles, ordnance, and shipbuilding are notable for the absence of large firm efficiency and the absence of effective use of market power by leading firms. Author (GRA)

N84-23358# Defense Fuel Supply Center, Alexandria, Va.

TACTICAL BUYING DECISIONS FOR STRATEGIC PETROLEUM RESERVE SPOT PROCUREMENTS: THE TUNNEL THEORY Final Report

L. C. ERVIN / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 376-382 1983

(AD-P002812) Avail: NTIS HC A24/MF A01 CSCL 15E

Procurement of crude oil on the spot market at minimum prices requires economic analysis which focuses on the discovery of market price levels and the determination of short-run market direction. This paper presents the results of statistical research concerning the formation of spot prices in the crude oil market. Variables suggested by the economic theory of raw material and commodity markets are investigated. The demand for incremental (spot) volumes of crude oil is found to be derived from the demand for incremental volumes of petroleum products. Insights gained from this analysis are used to establish tactical decision rules to be followed when making purchases under the provisions of the Defense Fuel Supply Center's open and continuous solicitations on behalf of the Department of Energy's Strategic Petroleum Reserve. The results of this research are also shown to be important input for strategic decisions concerning the mix and timing of spot and long-term contract procurements. GRA

N84-23372# Advanced Technology, Inc., Arlington, Va.

IMPROVING THE EFFECTIVENESS OF AWARD FEE CONTRACTS FOR PROGRAM MANAGEMENT SUPPORT SERVICES Final Report

A. C. MEINERS, JR. / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 481-483 1983

(AD-P002827) Avail: NTIS HC A24/MF A01 CSCL 15E

This article reports on a method to improve the effectiveness of Cost Plus Award Fee contracts used for program management support services. The approach involves allowing employee participation in the receipt of award fee dollars thru a concept called Cost Plus Award Fee, Employee Participation, CPAF (EP). An example of an unsuccessful attempt to use CPAF (EP) is presented and a possible solution to problems associated with the use of EP on support service contracts is introduced. The recommended solution is centered around the use of a criteria oriented EP system, similar to criteria developed for Cost/Schedule Criteria System. A major element in the EP system presented is simplicity, in that any EP system must be easy for a contractor to administer. The article concludes with a structured recommendation that CPAF (EP) criteria be developed and tested. Author (GRA)

07 ECONOMICS, COSTS AND MARKETS

N84-23373# Office of the Under Secretary of Defense for Research and Engineering, Washington, D. C.

CONTRACT REQUIREMENTS: A KEY TO CONTROLLING DOD ACQUISITION COSTS Final Report

F. E. DOHERTY *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 485-489 1983

(AD-P002828) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper suggests that controlling contract requirements can hold the key to lowering DoD systems acquisition costs. It describes a proposed DoD initiative designed to help control imposition of non-cost-effective contract requirements in DoD contracts. Major recommendations from this report call for: (a) Specifying in request for proposals (RFPs) and contracts what is needed, not how to accomplish it; (b) requiring contractors to tailor during one phase for application to the next; (c) not requiring referenced documents to be contractual unless specifically identified as such; (d) ensuring that production specifications are not contractually applied to production; and (e) providing incentives to program managers to encourage accomplishment of the recommendations cited above. This paper concludes that the key problem to be solved is bridging the gap between current DoD policy and practice. GRA

N84-23376# Army Procurement Research Office, Fort Lee, Va. **A SURVEY OF CONTRACTOR PRODUCTIVITY MEASUREMENT PRACTICES Final Report**

M. G. NORTON and W. V. ZABEL *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 501-505 1983

(AD-P002831) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper is extracted from an interim APRO report describing the results of a survey of contractor productivity measurement practices. Respondents ranking organizational performance evaluation factors listed productivity fifth in importance behind profitability, effectiveness, quality, and efficiency. Problems encountered in measuring productivity were usually due to the complexities of quantifying and relating various input and output factors involved. Although no evidence was found from the survey that an integrated total factor productivity measurement system has been implemented, production cost and productivity information is available and currently being tracked with varying success by defense contractors. The most popular indices used are value added/employee and comparison of standard hours to actual hours. Author (GRA)

N84-23389# Joint Publications Research Service, Arlington, Va. **USE OF ECONOMIC MECHANISMS IN MANAGING SCIENTIFIC AND TECHNICAL PROGRESS**

P. POGUDIN and Y. OSATYUK *In its* USSR Rept.: Sci. and Technol. Policy (JPRS-UST-84-004) p 15-24 23 Feb. 1984 Transl. into ENGLISH from Planovoye Khozyaystvo (USSR), no. 11, Nov. 1983 p 72-78

Avail: NTIS HC A04

The use of economic incentives as a means of stimulating scientific and technical progress is discussed. Research and development in the chemical industry is used as an example for analysis and economic modeling. The economic effect of these incentives on scientific organizations and the resulting research is examined with added suggestions for future incentive funds included. M.A.C.

N84-23392# Joint Publications Research Service, Arlington, Va. **TECHNICAL AND ECONOMIC INDICATORS FOR INDUSTRIAL TECHNOLOGICAL INSTITUTES**

Y. BERLINER *In its* USSR Rept.: Sci. and Technol. Policy (JPRS-UST-84-0070) p 11-19 28 Feb. 1984 Transl. into ENGLISH from Planovoye Khozyaystvo (USSR), no. 11, Nov. 1983 p 78-82

Avail: NTIS HC A05

The development of a coherent policy for the evaluation of technical and economic indicators for scientific research is investigated. The effectiveness of technological and scientific institutes based on economic impact is determined with emphasis

on production costs, labor management, and resource allocation. The reorganization necessary to implement the proposed evaluation policy is included. M.A.C.

N84-24495# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Raumfahrt.

PROFITABILITY IMPROVEMENT OF PROJECTS BY EARLY CONSIDERATION OF LIFE CYCLE COST REDUCTION [VERBESSERUNG DER WIRTSCHAFTLICHKEIT VON PROJEKTEN DURCH FRUEHZEITIGE LEBENSZYKLUSKOSTEN (LZK)-BETRACHTUNG]

B. J. MADAUSS 16 Feb. 1983 32 p refs Partly in GERMAN and ENGLISH Conf. on Ges. fuer Projektmanagement, Munich, 16 Feb. 1983

(MBB-UR-620-83-O) Avail: NTIS HC A03/MF A01

Life cycle costs, average unit fly away cost, and design to cost are defined. Program costs and program phases in the life cycle costs of a system are presented. The political decision making in the production of public goods is explained. The main milestones in and main activities during life cycle of a system are presented. The parameters influencing life cycle costs are given.

Author (ESA)

N84-25504# Societe Nationale Industrielle Aerospatiale, Paris (France). Direction Industrielle.

VALUE AND COMPETITION [VALEUR ET COMPETITION]

J. BULTEL and R. TASSINARI 20 Jun. 1983 11 p In FRENCH

(SNIAS-832-501-101) Avail: NTIS HC A02/MF A01

A Frenchman associates the word value with a costly object of the finest quality. The concept does not bring up the notion of the exchange value which is implied in the American usage of the term. Value to a buyer is based on quality as well as life cycle and operating costs. To the seller, quality and production costs are factors to be considered when determining the marketing price (or value of exchange). Transl. by A.R.H.

N84-25505# Office of the Comptroller of the Army, Washington, D. C. Directorate of Cost Analysis.

NOW: AN INITIAL APPROACH TO COLLECTION OF MAJOR MATERIEL SYSTEMS ACTUAL COSTS

D. PHILIPS and M. CARSON Oct. 1983 22 p

(AD-A139845; DCA-P-98) Avail: NTIS HC A02/MF A01 CSCL 05A

This paper presents an approach that in the foreseeable future could provide a significant percentage of major Army systems' life cycle actual (historical) costs. Also presented are procedures that could be implemented now to collect/derive a significant portion of those costs. This approach was tested on three Selected Acquisition Report (SAR) systems. The test procedures and results are included. Author (GRA)

N84-25525# International Trade Administration, Washington, D.C. Industry Analysis Div.

COMPETITIVE ASSESSMENT OF THE U.S. CIVIL AIRCRAFT INDUSTRY Final Report

Mar. 1984 192 p refs

(PB84-154913) Avail: NTIS HC A09/MF A01 CSCL 05C

The future international competitiveness of the U.S. civil aircraft industry is examined in terms of its principal businesses: large transport, commuter, business and helicopter aircraft. There is no single view of how the U.S. large transport aircraft business may fare in the 1990s in competition with the European Airbus and a potential, independent entry from Japan. U.S. international competitiveness depends on the performance of an interaction among an array of economic, market and technological variables. The United States does not have an independent entry in the larger commuter aircraft market, a market whose size continues to grow. Future U.S. international competitiveness in this business is expected to remain weak. U.S. business aircraft and helicopter businesses are challenged by strong foreign competition, and imports now account for a significant share of the U.S. market. GRA

N84-27473# PEL, Inc., Baton Rouge, La.
**INTERACTIVE RISK ANALYSIS AND DEVELOPMENT OF
 STANDARDIZED FACTORS** Final Report, 1 Aug. 1983 - 31 Jan. 1984

G. H. WORM Jan. 1984 34 p
 (Contract F33615-83-K-5075)
 (AD-A140758; BRMC-83-5075) Avail: NTIS HC A03/MF A01
 CSCL 09B

Part I presents a brief description of a computer program which is available to perform calculations needed in a risk analysis. The program allows a user to estimate the risk associated with any number of variables and to display the distribution of any arithmetic (+, -, and/or *) combination of the variables. The mode of operation is designed to be similar to a calculator. Rather than entering in a single number, the user must supply a low, most likely, and high for each variable. Variables can be added, subtracted, or multiplied; intermediate calculations can be stored; and the distribution of the total can be displayed at any time. Part II discussed the development of a microcomputerized statistical price risk analysis model which allows a user to estimate a distribution of total cost using complete 14 objective input. The objective characteristics of a contract which introduces cost risk are identified, and the standardized factors associated with these characteristics are defined and applied to a cost breakdown. The use of standardized factors has several advantages over subjective estimates of risk: the cost risk analysis is objective rather than subjective; estimates of risk are independent of biases and experience; risk analysis results are comparable between contracts; standardized factors provide documentation for the cost risk analysis; oversights are eliminated; and standardized factors allow for the incorporation of many different points of view. GRA

N84-27602# Price Waterhouse and Co., Washington, D. C. Office of Government Services.
**REPORT ON U.S. DOMESTIC AND INTERNATIONAL
 TELECOMMUNICATIONS AND INFORMATION MARKETS** Final Report

Feb. 1984 204 p refs Sponsored by NTIA
 (PB84-166362) Avail: NTIS HC A10/MF A01 CSCL 05C

Contents: the U.S. telecommunications equipment market, 1970-82; the data processing equipment market, 1970-82; U.S. licensing and regulation of exports and imports of telecommunications and information equipment; U.S. Government procurement policies for telecommunications and information equipment; market for U.S. firms in telecommunications services; U.S. information services industry, 1970-82; new telecommunications and information services currently available or under development; Identification of the market for remote sensing by satellites; selected users of and benefits from telecommunications and information services. GRA

N84-27756*# Booz-Allen and Hamilton, Inc., Arlington, Va.
SPACE STATION COMMERCIAL USER DEVELOPMENT
 20 Jan. 1984 51 p
 (Contract NASW-3775)
 (NASA-CR-173688; NAS 1.26:173688) Avail: NTIS HC A04/MF
 A01 CSCL 22A

The commercial utilization of the space station is investigated. The interest of nonaerospace firms in the use of the space station is determined. The user requirements are compared to the space station's capabilities and a feasibility analysis of a commercial firm acting as an intermediary between NASA and the private sector to reduce costs is presented. M.A.C.

N84-28662# Ohio State Univ., Columbus. Dept. of Computer and Information Science.

**THE DESIGN OF AN EXPERT SYSTEM FOR CONTRACT PRICE
 ANALYSIS** Interim Technical Report, 15 Jul. - 30 Sep. 1983
 on Phase 3

B. CHANDRASEKARAN, J. F. DILLARD, and K. RAMAKRISHNA
 30 Sep. 1983 18065 p
 (Contract F33615-82-C-5114)
 (AD-A140927; BRMC-82-5114-3) Avail: NTIS HC A04/MF A01
 CSCL 05A

This report discusses the feasibility of designing an expert system for contract price analysis. It recommends an intelligent manual for base-level procurement be implemented. Also presented is a prototype design in the ZOG information management system. The system architecture and the organization of pricing knowledge in the system was determined by field investigations. The pricing task is a relatively small component of the total procurement task. This coupled with the distributed nature of the information needed for price analysis render the implementation of a more complex, self-contained expert system infeasible at the present time. Also discussed are implications for future research and the limitations of the proposed design. Several alternative designs are evaluated. Author (GRA)

N84-28678# European Space Agency. ESRIN, Frascati (Italy). Information Retrieval Service.

**THE ECONOMICS OF COMPUTERIZED INFORMATION
 DISSEMINATION**

M. F. SAKSIDA 1984 5 p Presented at Conf. on the Future of Data Bases in Spain and the EEC, Madrid, 15-16 Mar. 1984; sponsored by Fundacion de la Red de Inform. Cient. Automatizada
 Avail: NTIS HC A02/MF A01

The European information dissemination market is reviewed. The fusion of political and economic factors is discussed. Future trends are indicated. Author (ESA)

N84-31062# Naval Sea Systems Command, Washington, D.C.
IMPROVING SYSTEM AFFORDABILITY

N. N. RIEGLE Mar. 1984 15 p Presented at the 21st Ann. Tech. Symp. of the Assoc. of Sci. and Engr. of the Naval Sea Systems Command, Washington, D.C., 1984
 (AD-A142387) Avail: NTIS HC A02/MF A01 CSCL 05C

This paper is an announcement of the expansion of the Navy's Standard Electronic Module Program (SEM) into a larger more comprehensive program to be known as SHARP for Standard Hardware Acquisition & Reliability Program. The paper is intended to discuss the factors which impact cost in all phases of the program's life; a common sense look at what major cost drivers are, and what can be done to control them. The paper will analyze standardization, quality, reliability, testability, and reparability with a look at their impacts on Navy life cycle costs. Special emphasis will be placed on the ability of standardization programs to adopt new technologies. In this day of increased costs and restriction of funds, it is imperative that weapons systems developers recognize the full impact of their efforts on overall life cycle costs and not concentrate solely on the development phase. GRA

N84-32263# Boeing Military Airplane Development, Wichita, Kans. Military Training Systems Div.

**PROFIT RESPONSIBILITIES IN THE SIMULATION AND
 TRAINING EQUIPMENT INDUSTRY**

J. L. MITCHAELE In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 363-366 16 Nov. 1983
 (AD-P003497) Avail: NTIS HC A17/MF A01 CSCL 05C

The objective of increased readiness through training can be enhanced through mutual military/industry efforts to support a viable earnings position. Strong financial health of companies competing in the market provides the resources, knowledge and systems that supply advanced technology and products that meet military training objectives. Government agencies can contribute by providing clear definitions of the product needed, by imposing

only specifications necessary to meet acceptable quality, and by contracting provisions commensurate with program risk. With firm product goals and applicable specifications, industry can minimize risk through sound planning and stable performance. Industry can contribute by developing resources and systems that are efficient and effective in providing training products. Capability growth fosters innovativeness in advanced planning and productiveness, which are significant to providing quality products on schedule at the lowest cost possible. Industrial growth to bring this about is possible only if industry is in a strong financial position.

Author (GRA)

N84-32269# Department of Energy, Washington, D. C. Office of Project and Facilities Management.

COST AND SCHEDULE CONTROL SYSTEMS CRITERIA FOR CONTRACT PERFORMANCE MEASUREMENT, INFORMATION PAMPHLET

May 1984 54 p

(DE84-012576; DOE/MA-0155) Avail: NTIS HC A04/MF A01

Interested DCE and industry personnel are informed about the basic concepts and general requirements of the Cost and Schedule Control Systems Criteria (CSCSC) of DOE Order 2250.1A. The CSCSC do not represent a management system nor are specific methods of organization or operation prescribed. The criteria are intended to serve as standards of measuring adequacy of management control systems. Objectives in using the criteria are: (1) to provide an accurate status of contract progress; (2) to provide early visibility to problems - prevent surprises; (3) to improve estimated final cost projections; (4) to improve on shortcomings of prior requirements; and (5) to minimize proliferation of systems and data problems. The CSCSC contain thirty-five criteria which are grouped into five categories: organization; planning and budgeting; accounting; analysis; and revisions and access to data.

N84-32369# Civil Aeronautics Board, Washington, D.C.

VOLUNTARY ACCOUNTING SYSTEMS FOR A SMALL AIR CARRIER: REVENUES, FINANCIAL AND TRAFFIC STATISTICS

1984 122 p refs

(PB84-210996) Avail: NTIS HC A06/MF A01 CSCL 05A

The Civil Aeronautics Board published a booklet to assist small airlines in setting up internal accounting procedures. The booklet shows small airlines not subject to CAB financial filing requirements how to set up their own internal systems. No mandatory reports are included in the booklet. The CAB is providing it to small airline companies as a service. The booklet describes methods of setting up balance sheets, profit and loss accounts, key statistical ratios for management analysis and evaluation, and methods to calculate various traffic statistics.

GRA

N84-34205# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).

WORST CASE PERFORMANCE OF SOME HEURISTICS FOR LOT SIZE PROBLEMS [DESEMPENHO, NO PIOR CASO, DE ALGUMAS HEURISTICAS PARA PROBLEMAS DE TAMANHO DE LOTE]

G. R. BITRAN, T. L. MAGNANTI, and H. H. YANASSE May 1984 13 p refs In PORTUGUESE; ENGLISH summary Presented at the 17th Simposio Brasileiro de Pesquisa Operacional, Rio de Janeiro, Nov. 1984

(INPE-3134-PRE/525) Avail: NTIS HC A02/MF A01

The uncapacitated dynamic lot size problem was considered. The worst case performance of some heuristics which use the idea of minimizing the average cost per unit is presented. These heuristics have arbitrarily large errors.

Author

LOGISTICS AND OPERATIONS MANAGEMENT

Includes Inventory Management and Spare Parts, Materials Management and Handling, Resources Management, Resource Allocation, Procurement Management, Leasing, Contracting and Subcontracting, Maintenance and Repair, Transportation, Air Traffic Control, Fuel Conservation, Operations, Operational Programs.

A84-10416

THE NATIONAL AIR-SPACE SYSTEM CONTINGENCY PLAN

R. H. THRONE (FAA, Air Traffic Service, Washington, DC) Energy (UK) (ISSN 0360-5442), vol. 8, Aug.-Sept. 1983, p. 643-652.

The development, coverage, and application of a National Air Traffic Control Contingency Plan designed for use when the 11,000 ATCs in the U.S. went on strike are described. The Plan, initiated by the FAA, was intended to be available before the union contract terminated. Consideration was given to the remaining work force, the priorities of the air services, and maximization of the aircraft movement. Concomitantly, the number of control commands necessary for each aircraft was minimized, a factor that depended on aircraft spacing, both laterally and vertically. Care was taken not to disrupt foreign airline service and thereby precipitate retaliatory actions. Supplementary ATCs were obtained by selecting ATCs who had recently moved up to management and existing supervisors. Actions were coordinated with military and medical planners to order the priority flights, and predetermined altitude separations were configured between cities. Command posts were identified, including personnel, and the criteria and time limits for approval of flight plans were codified.

M.S.K.

A84-12185

AIRSPACE MANAGEMENT CAN BE IMPROVED

C. BENTON (International Civil Aviation Organization, Technical Assistance Bureau, Montreal, Canada) ICAO Bulletin, vol. 38, Sept. 1983, p. 18-21.

The objectives of the Air Traffic Services system, as stated in the ICAO's Annex 11, are the prevention of collisions between aircraft (especially in maneuvering areas), the provision of advice and information useful for the safe and efficient conduct of flights, and the notification of the appropriate authorities of aircraft in need of search and rescue activities. Above all, an orderly flow of traffic must be maintained. Attention is given to the additional need for civil-military cooperation for these tasks in flight information regions (FIRs) where military authorities have appropriated large airspace areas. It is noted that some FIRs include, by international agreement, airspace over high seas where the state concerned, while providing air traffic services, does not exercise sovereignty.

O.C.

A84-12316#

FLIGHT TEST AIRSPACE - A VITAL PART OF THE PLAN

K. J. HOLT (McDonnell Aircraft Co., St. Louis, MO) AIAA, AHS, IES, SETP, SFTE, and DGLR, Flight Testing Conference, 2nd, Las Vegas, NV, Nov. 16-18, 1983. 6 p. (AIAA PAPER 83-2711)

The organization, control, and use patterns of the national airspace are discussed. Air traffic consists of airlines, business aircraft, light aircraft, and military aircraft, as well as the aerospace contractor. A National Airspace Review study commissioned by the FAA examined the structure and efficiency of the airspace guidelines, the conflicts between the FAR and FAA handbooks, and evaluated ATC practices. The study led to recommendations to review military use of national airspace annually, to formally study the see-and-avoid concept at all altitudes and airspeeds, and to hasten reporting of new VFR training routes. Priority for restricted airspace is to be given to using agencies, including use of the airspace for nonhazardous activities. Restrictions are to be defined for recurring routes used by civil aircraft at speeds below 250 km and altitudes below 10,000 ft. Finally, the procedures for

obtaining airspace for flight tests of new aircraft configurations are explored. M.S.K.

A84-15213

MANAGEMENT OF LOGISTIC SUPPORT COSTS IN THE EQUIPMENT ACQUISITION PHASE

D. E. COLLINS (Exxon Corp., Florham Park, NJ) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 264-271. DOD-supported research.

Management control objectives in the logistic support cost (LSC) commitment goal communicated to contractors by the DOD during equipment procurement are explored. A cost model framework (CMF) is communicated to the contractor in order to establish controllable equipment logistic parameters prior to bidding for contracts. A cost target is determined, including an estimate of how well the equipment will perform in the operational environment of the LSC. Particular attention is given to factors which will influence the life cycle cost of the equipment, and thus affect the cost estimates at the onset. Statistical sampling is performed with a Poisson failure assumption. Consideration is also devoted to questions of legal responsibility and risk. M.S.K.

A84-20645

SOME TECHNICAL AND CONTRACTUAL ASPECTS OF TRANSPONDER LEASING BY EUTELSAT

C. L. MORROW and F. M. GALANTE (EUTELSAT, Paris, France) Space Communication and Broadcasting (ISSN 0167-9368), vol. 1, Dec. 1983, p. 385-391.

After reviewing the services offered by the EUTELSAT system in general, the paper concentrates on the transponder lease service. The general technical characteristics of the resources available for leasing are reviewed. The development of the offering of the leasing service is described both in the light of the Constitutive Agreement of the EUTELSAT Organization and its increasing significance vis-a-vis other services. In particular, the process followed to enable the Organization to meet the consumers' demand for such service from a legal viewpoint is described. Finally, the paper deals with the approach followed in developing difference types of lease agreements and outlines their salient features. Author

A84-44732

THE O'HARE RUNWAY CONFIGURATION MANAGEMENT SYSTEM

R. L. FAIN and A. N. SINHA (MITRE Corp., McLean, VA) IN: Air Traffic Control Association, Annual Fall Conference, 27th, Atlantic City, NJ, October 18-21, 1982, Proceedings. Arlington, VA, Air Traffic Control Association, 1982, p. 68-75. Sponsorship: U.S. Department of Transportation. refs
(Contract DOT-FA01-82-C-10003)

The computer-logic Runway Configuration Management System (RCMS) developed for O'Hare International Airport as part of the FAA Integrated Flow Management program is characterized. The configuration of the O'Hare TCA is described, and its efficiency is shown to be primarily dependent on runway utilization. The logical structure of the RCMS is explained; the roles of the tower-cab, airway-facilities, and assistant-chief positions in its operation are described; the primary advantages of RCMS are examined; and the integration of RCMS in an overall automated ATC system is considered. Flow charts, maps, and sample printouts are provided. T.K.

A84-45666* College of William and Mary, Williamsburg, Va.

A MULTI-ITEM MAINTENANCE CENTER INVENTORY MODEL FOR LOW-DEMAND REPARABLE ITEMS

M. K. SCHAEFER (College of William and Mary, Williamsburg, VA) Management Science (ISSN 0025-1909), vol. 29, Sept. 1983, p. 1062-1068. refs
(Contract NSG-1625)

In many military and commercial contexts, complex equipment undergoes scheduled maintenance overhauls at regular intervals during which all failed components are replaced. Failure to have replacements on hand for all failed parts requires emergency

measures at premium cost. When reparable parts are highly reliable and expensive, both holding and shortage costs are high. This model determines the reparable parts inventory for a maintenance center under three alternative criteria: (1) maximizing job-completion rate subject to constraint on total holding costs, (2) minimizing total holding costs plus expected job noncompletion costs, and (3) minimizing total holding costs subject to a required minimum job-completion rate. Exact solutions may be obtained using dynamic programming. Approximate solutions, found easily by marginal analysis, have readily computed bounds on possible error. The solution methods for the three formulations are illustrated in a simple example. Author

A84-46582

AIRLINE MAINTENANCE MANAGEMENT SYSTEM (AMMS)

Y. Y. CHIA (Northrop University, Inglewood, CA) IN: Simulation and modelling; Proceedings of the Eighth International Symposium, Orlando, FL, November 9-11, 1983. Anaheim, CA and Calgary, Canada, Acta Press, 1984, p. 173-176. Research sponsored by Northrop University.

The Airline Maintenance Management System (AMMS) is a user-friendly interactive computer simulation management game offering a system-wide perspective on airline maintenance operations at the management level, and is intended to serve as an educational tool in airline maintenance managers' training for planning, organization, coordination, and operations control functions. Scheduled aircraft are described by the AMMS model as transactions which undergo maintenance on the basis of an individual aircraft maintenance schedule. O.C.

N84-13146# Army Test and Evaluation Command, Aberdeen Proving Ground, Md.

INTEGRATED LOGISTIC SUPPORTABILITY (AVIATION MATERIEL) Final Report

1 Sep. 1983 43 p
(AD-A132367; TOP-7-3-507) Avail: NTIS HCA03/MFA01
CSCL 15E

This TOP(Test Operations Procedures) presents a systematic method for conducting an integrated logistic supportability test in the developmental test environment. Subelements of the logistic supportability test covered by this TOP are: End item requirement; Supply support; Technical data/equipment publication; Support and test equipment; Manpower and personnel, training, and training devices; Transportation and Handling; and Facilities.

Author (GRA)

N84-14115# Logistics Management Inst., Washington, D. C.

THE AIRCRAFT AVAILABILITY MODEL: CONCEPTUAL FRAMEWORK AND MATHEMATICS

T. J. OMALLEY Jun. 1983 111 p
(Contract MDA903-81-C-0166)
(AD-A132927; AD-F630031; LMI-AF201) Avail: NTIS
HCA06/MFA01 CSCL 01C

The Aircraft Availability Model (AAM) is an analytical model and decision support system that relates expenditures for the procurement and depot repair of recoverable spares to aircraft availability rates, by weapon system. The AAM is based on standard probabilistic and marginal analysis concepts of inventory systems theory. It addresses both the multi-echelon aspect of supply (e.g., depots and bases), and the multi-indenture relations that exist among components. The report provides a complete description of the AAM: what the model does, how it does it, and the underlying mathematics. A description of the U.S. Air Force application to the programming, budgeting, and allocation of resources for recoverable spares is included. Author (GRA)

08 LOGISTICS AND OPERATIONS MANAGEMENT

N84-14711# Naval Postgraduate School, Monterey, Calif. Dept. of Administrative Sciences.

TECHNICAL AND ECONOMIC ANALYSIS OF THE PLANNED VISUAL DISPLAY TERMINAL EMPLOYMENT FOR THE STOCK POINT LOGISTICS INTEGRATED COMMUNICATIONS ENVIRONMENT (SPLICE) M.S. Thesis

S. E. JAMES Jun. 1983 81 p

(AD-A133642) Avail: NTIS HCA05/MFA01 CSCL 09B

The Stock Point Logistics Integrated Communications Environment (SPLICE) concept is designed to augment the existing Navy Stock Point and Inventory Control Point ADP facilities, in response to increasing demands for data processing, within the scope of a decentralized telecommunications environment. This thesis provides a critical review of the existing plan for employment of Visual Display Terminals (VDTs) within the SPLICE concept. VDT employment considerations are examined and alternative VDT employment options are presented. A technical and economic analysis is performed for both the planned and proposed alternative VDT equipment and employment options. Recommendations based on these findings are then presented.

Author (GRA)

N84-15884 Selenia Industrie Associate S.p.A., Rome (Italy). Naval Systems Div.

AN APPROACH TO LOGISTIC PROBLEMS BY THE L-TRANSFORM METHOD

U. G. FLORIO *In its Riv. Tec. Selenia*, Vol. 8, No. 2, 1982 p 14-20 1982 refs

Avail: Issuing Activity

A computation model for the average unavailability waiting time of spares and optimization procedure of the total cost of a store with replaceable spare parts is presented. The model is based on the Laplace transformation. The probability space examined is the real axis, and experimental results are the failure times of the observed system. Computation examples for the Poisson model case validate the approach.

Author (ESA)

N84-16160# Congressional Budget Office, Washington, D. C. **IMPROVING THE AIR TRAFFIC CONTROL SYSTEM: AN ASSESSMENT OF THE NATIONAL AIRSPACE SYSTEM PLAN**

D. L. LEWIS Aug. 1983 100 p refs

Avail: NTIS HC A05/MF A01

A comprehensive National Airspace System Plan to modernize and improve the efficiency of the nation's air traffic system was formulated. The system today is a blend of several generations' engineering and equipment, much of which has been outmoded by technological advances. Though still adequate to maintain a high standard of safety, the system is already the cause of rising operating costs, and its effectiveness may soon be limited by the demands of increased air traffic. Further, because the system is made up of numerous installations and is heavily labor intensive, there is significant potential for improved effectiveness with fewer facilities and less manpower. The plan would achieve such efficiency gains, but at considerable investment cost both to the federal government and to users of the air traffic control system. If fully implemented, the plan offers the nation a sound economic investment. The cost effectiveness of the plan, however, depends on organizational changes including a consolidation of facilities and a reduction in staff.

S.L.

N84-18108# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

AN APPROACH TO THE DESIGN OF A MANAGEMENT INFORMATION SYSTEM: DEVELOPMENT PROCEDURE FOR THE INDONESIAN DEFENSE LOGISTICS STAFF M.S. Thesis

E. S. WREKSOMINDOJO Sep. 1983 85 p

(AD-A134974; AFIT-LSSR-61-83) Avail: NTIS HC A05/MF A01 CSCL 05B

The roles and participation of the managers in the Office of the Indonesian Defense Logistics Assistant has always been a major important factor in the establishment of the Indonesian Defense Logistics Management Information System (MIS). The objective of this research was to develop a procedure to describe the basic roles of these managers during the MIS development.

A review of classical system development methodologies and factors affecting the success and failure of MIS was used as a foundation for developing the procedures. The seven steps of MIS design as outlined by Joel E. Ross was selected, enumerated, and applied to the Office of the Indonesian Defense Logistics Assistant environment. Further analysis on Determination of Information Needs was used as an example. Although additional research involving how to implement the managers' roles in the MIS development will be needed, this research will become a useful MIS development reference guide for the managers in the Office of the Indonesian Defense Logistics Assistant.

Author (GRA)

N84-19028# North Carolina Univ., Charlotte. Dept. of Mathematics.

RESEARCH ON SHOCK MODELS, WEAR PROCESSES, REPLACEMENT AND MAINTENANCE POLICIES Final Interim Report, 1 Jul. 1982 - 30 Jun. 1983

M. ABDEL-HAMEED Aug. 1983 10 p

(Contract AF-AFOSR-0245-80; AF PROJ. 2304)

(AD-A135620; AFOSR-83-0818TR) Avail: NTIS HC A02/MF A01 CSCL 12A

The Principal Investigator and the Co-investigator attended four conferences giving papers at two of them. The Principal Investigator organized a Conference on Stochastic Failure Models, Replacement and Maintenance Policies, Accelerated Life Testing. He continued his research on shock models, wear processes, replacement and maintenance policies; revised the paper Life Distribution Properties of Devices Subject to a Levy Wear Process, wrote the paper Pure Jump Damage Processes. He also wrote Conservative and Dissipative Parts of Non-Measure Preserving Weighted Composition Operators. The Co-investigator presented a paper on Approximate Optimal Replacement Policies and Their Stability.

GRA

N84-19126# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

MULTIYEAR SUBCONTRACTOR SELECTION CRITERIA ANALYSIS M.S. Thesis

D. L. GRAY and L. W. SANDERS Sep. 1983 206 p

(AD-A135638; AFIT-LSSR-106-83) Avail: NTIS HC A10/MF A01 CSCL 05A

Multiyear procurement (MYP) has been sited as an acquisition strategy used to check undesirable defense industry trends such as declining productivity, increasing weapon system costs, and declining subcontractor industrial base. The Department of Defense (DOD) has developed criteria for selecting prime contractors for MYP contracts, but no formal selection criteria have been established for selecting MYP-subcontractors. The research objectives were to: (1) determine the extent that MYP contracts are used for DOD programs; (2) determine the contract and subcontractor characteristics associated with the use of MYP subcontracts; and (3) determine the selection criteria that contractors consider important when contemplating the placement of MYP subcontracts with subcontractors. Comparative analyses were performed on the rankings of 23 MYP selection criteria. The research findings were: (1) MYP is not extensively used for DOD programs; (2) a common set of MYP contract and subcontractor characteristics were identified; and (3) an overall ranking of 23 MYP selection criteria for consideration in placing future MYP subcontracts was developed.

GRA

N84-19175# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

AUTOMATED STORAGE AND RETRIEVAL SYSTEMS-A CONSOLIDATION OF GUIDANCE FOR PROJECT MANAGEMENT AND IMPLEMENTATION M.S. Thesis

T. K. BETTS and J. H. MUCCI Sep. 1983 224 p

(AD-A135571; AFIT-LSSR-91-83) Avail: NTIS HC A10/MF A01 CSCL 05B

Presently Air Force management of Automated Storage and Retrieval Systems (ASRS) projects lacks comprehensive guidance. No single document synthesizes all of the considerations for

planning of automated materials handling equipment or automated warehouses. In addition, current guidance used for ASRS project planning and management are inadequate for such a complex undertaking. This thesis reviews up-to-date trends in the materials handling industry and modern ASRS project management. From the review, those considerations relevant to future Air Force ASRS projects are evaluated. Additionally, recommendations on how future Air Force ASRS projects should be planned and managed are offered. The recommendations put forward in this thesis should benefit managers of future Air Force ASRS projects.

Author (GRA)

N84-19280# Naval Postgraduate School, Monterey, Calif.
A MULTI-PERIOD REPAIR PARTS INVENTORY MODEL FOR A NAVAL AIR REWORK FACILITY M.S. Thesis
 A. S. ASSELIN Sep. 1983 71 p
 (AD-A136873) Avail: NTIS HC A04/MF A01 CSCL 15E

A ready supply store (RSS) containing repair parts which are anticipated to be used during the production process has been established to support the naval air rework facility (NARF). While this supporting inventory was previously constructed using historical demand data, a single period model and a two-period model have been proposed which compute stock levels based on quarterly production schedules. This thesis extends the use of the projected production information in calculating RSS inventory levels from two periods to multiple periods. The disadvantage of the single period model is that it ignores information about future schedules. The multiperiod model uses the information on future schedules to behave more optimally. The multi-period model shows significant differences in inventory levels over the single-period model as a result of the added information. The multi-period model is also easily programmed on a computer and is preferred over the single-period model.

GRA

N84-19390# Industrial Coll. of the Armed Forces, Washington, D.C.
MOBILIZATION AND DEFENSE MANAGEMENT TECHNICAL REPORTS SERIES. MANAGEMENT IMPLICATIONS OF INDUSTRIAL SUPPORT CAPABILITIES FOR SPACE SHUTTLE OPERATIONS

J. F. REYNOLDS and J. L. GRAHAM, JR. May 1983 88 p
 (AD-A137460; NDU/ICAF-83/013; IR-15) Avail: NTIS HC A05/MF A01 CSCL 22B

This study examines implications of Space Shuttle logistics support concepts and policies, which have been planned to rely heavily on contractor or vendor support through a substantial portion of the system's operational life, especially in the areas of spares and maintenance. The analysis focuses on the effects of open production lines and the impact on logistics support if production is completed or terminated, with ensuing shutdown of those lines. Unique characteristics of Space Shuttle support in terms of equipment, organizational roles, and funding and cost are identified; and risks associated with both operational support and funding are addressed.

Author (GRA)

N84-21112# Du Pont de Nemours (E. I.) and Co., Aiken, S.C. Savannah River Plant.

USE OF MICROCOMPUTERS FOR INVENTORY MANAGEMENT WITH UNCERTAIN DEMAND

B. F. MEADOWS 1984 16 p Presented at the Am. Prod. and Inventory Control Soc. Specialty Seminar, Palm Springs, Calif., 30 Jan. - 1 Feb. 1984

(Contract DE-AC09-76SR-00001)

(DE84-005179; DP-MS-83-105) Avail: NTIS HC A02/MF A01

How a microcomputer is used for analysis of inventory trends to optimize inventory investment and customer service level in a distribution environment with uncertain demand, and to support an inventory subsystem resident on a main computer was described. A microcomputer gives the user total control over the system, immediate response, low cost, and spreadsheets for fast, accurate ongoing analysis.

DOE

N84-23299# Defense Logistics Agency, Alexandria, Va.
CONSOLIDATION OF DOD BIDDER'S MAILING LIST APPLICATION Final Report

E. PARSONS /In AF Business Res. Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 28-31 1983
 (AD-P002752) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper describes a need to streamline the processing of Bidder's Mailing List (BML) Applications, Standard Form 129, as supplemented, and at the same time, takes the first step toward modernizing an important element in our acquisition process. History has shown us that wars are lost because of the lack of supplies in the right place at the right time. With today's modern weapons systems, flight faster than sound, capability to land on the Moon and return to Earth and numerous other spectacular accomplishments, it would be negligent not to concentrate also on our ability to support these system with rapidly and effectiveness. The consolidation of the BML applications to one or more locations would be cost-effective for Government and industry. This paper will support the need to consolidate the bidder's mailing list applications. It will also point out that the need to consolidate could well be the first step in streamlining the acquisition process.

GRA

N84-23303# Army Logistics Management Center, Fort Lee, Va.
DESIGNING THE EQUITABLE RISK CONTRACT Final Report

R. F. WILLIAMS /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 49-53 1983

(AD-P002756) Avail: NTIS HC A24/MF A01 CSCL 15E

Department of Defense contracting faces such great uncertainty that contracts must be designed to share the resultant risk. This paper describes the steps for this risk-sharing: assessing sources of uncertainty and their probability of impact, assessing the impact of their uncertainties on both contractual partners' objectives, combining these impacts for total risk to the objectives, prioritizing the parties objectives, arraying the 2 sets of prioritized risk in order to equate them, and selecting the proper contractual devices to bring on this equity. The paper also suggests what research might be done on: (1) assessing the impact of uncertainties on contractual objectives, (2) developing operations research models to optimize risk sharing, (3) the impact of contractual devices on objectives, and (4) the design of experiments to effect this research.

Author (GRA)

N84-23322# Analytics, Inc., Dayton, Ohio.
INCREASING SPARES COMPETITION IN AFLC (AIR FORCE LOGISTICS CENTER) Final Report

T. M. MCCANN and J. R. BUTTERWORTH /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 161-166 1983

(AD-P002775) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper describes the results of a research effort sponsored by the Air Force Business Research Management Center at Wright Patterson AFB. The focus of the research was on the identification of the impediments to competitive spares acquisition and definition of those actions which can be taken to improve the capability of Air Force to achieve competition on spare parts. The effort included an extensive search of the literature and field visits to Air Logistics Centers involved with the purchase of spare parts. The research was structured around analysis of the impact of the Procurement Method Code on the competitive activities. The results of the research is a set of recommendations covering systemic changes in the initial system acquisition process and in the procedures used at the Air Logistics Centers in item screening and contracting which should provide the capability to improve the degree of attained competition for Air Force spare parts.

Author (GRA)

08 LOGISTICS AND OPERATIONS MANAGEMENT

N84-23326# Notre Dame Univ., Ind.
THE MAKE OR BUY DECISION—ITS NATURE AND IMPACT Final Report

J. G. BEVERLY, F. J. BONELLO, J. DASCHBACH, and W. I. DAVISSON / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 185-187 1983

(AD-P002779) Avail: NTIS HC A24/MF A01 CSCL 15E

There is no contractor at this time, in this Nation who can fabricate all the components needed for a major weapons system and deliver it in the time required and within cost limits. Therefore, the prime contractor must subcontract out certain of the components and parts needed for the system assembly. How do contractors make this division regarding the components and parts to be made versus those to be bought? This paper reviews the background for this area providing the theory and the practices as found during a recent study for the Air Force Business Research Management Center. Author (GRA)

N84-23327# Naval Air Systems Command, Washington, D. C.
MULTI-YEAR PROCUREMENT A 'TEAM APPROACH' Final Report

H. S. FROMER and J. L. SWEENEY / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 188-192. 1983

(AD-P002780) Avail: NTIS HC A24/MF A01 CSCL 15E

Teamwork, as demonstrated by Congressional actions to alter the laws, DoD's management and policy initiatives, the services requirements and funding planning and contractors and subcontractors productivity and risk assumption efforts has yielded better than expected results in the application of the Multi-Year Procurement Initiative Government, while recognizing that multi-year does not fit all programs, is realizing better than projected savings on the programs that have been selected for multi-year. Industry has found that an aggressive multi-year approach can stabilize employment, aid in their modernization programs and increase the efficiency of their existing operations. Everyone has found that the rewards have far exceeded the risks and it remains for Congress to determine whether it can overcome its penchant for year to year adjustments and take a long term view of defense procurement so that the scope of the multi-year application can grow beyond its present foothold. Meanwhile, Multi-Year Procurement, the 1980's version, is providing all the expected benefits by driving unit costs down, while improving our defense industrial base and putting people back to work, truly a initiative for our times. GRA

N84-23338# Oklahoma City Air Logistics Center, Tinker AFB, Okla.

RESHAPING THE PHILOSOPHY OF SPARE PARTS ACQUISITION: PROJECT PACER PRICE Final Report

G. LEININGER / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 239-242 1983

(AD-P002791) Avail: NTIS HC A24/MF A01 CSCL 15E

On June 1st, 1983, a new program called PACER PRICE began operation at the Oklahoma City Air Logistics Center. Staffed by an interdirector group of engineers, manufacturing planners, price analysts and packaging specialists, the program was designed as a thorough and comprehensive review process to determine optimum purchase method and price for every actively-purchased replenishment spare part managed at the Center. After three months of program operation, approximately 62 percent of the sole-source items have been recommended for competitive purchase, and the prices recommended for these items average about 35 percent below the latest contract prices adjusted for quantity and inflation. But beyond that, a new Philosophy of spare parts purchase has been formulated and effected as a procedural caveat: All spares should be both purchased competitively and PRICED TO CONFORM WITH COMPETITIVE-MARKET PRICES. The paper focuses on this philosophy, detailing in particular the mathematical models used to simulate competitive prices, and

offers suggestions for further research into the competitive market place. Author (GRA)

N84-23350# DOD Weapon Support Improvement and Analysis Office, Alexandria, Va.

POLICY INITIATIVES TO ACHIEVE READINESS AND SUPPORT OBJECTIVES Final Report

J. D. ARCIERI / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 327-329 1983

(AD-P002804) Avail: NTIS HC A24/MF A01 CSCL 15E

The fundamental responsibility of the Defense logistics community is to ensure the timely availability of the requisite support to enable our forces to effectively deter aggression, and should deterrence fail, to successfully undertake military operations that prevent the enemy from achieving his goals at minimum war cost to the U.S. and our allies. In essence, this means the logistics community of organic and industrial capability, must ensure military force readiness and sustainability. This formidable responsibility imparts a concurrently dual-edged challenge: obtaining affordable Life Cycle Cost/effective supportable systems; and continuing improvements in the effectiveness and efficiency of our logistics systems' operations. To meet this challenge DoD has undertaken several policy initiatives to achieve more intensive and effective logistics involvement in the acquisition process. Particularly, attention has been given to changing top level acquisition policy directives and instructions, and in changes to the logistics support analysis requirements outlined in MIL-STD-1388. The purpose of these changes being to concentrate adequate management attention on the early phases of the acquisition process where the greatest influence can be made on system design characteristics. GRA

N84-23351# Army DARCOM Materiel Readiness Support Activity, Lexington, Ky.

1982 US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND (DARCOM) INTEGRATED LOGISTIC SUPPORT (ILS) STUDY FINDING ON CONTRACTING FOR ILS Final Report

D. M. MORGAN / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 330-333 1983

(AD-P002805) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper gives a general overview of the objective, organization, and approach used by the 1982 DARCOM Integrated Logistics Support Study. The seven high payoff areas that the study concentrated on are listed but only the results of the solicitation documents study effort are discussed in detail. Each action item developed by the solicitation documents subgroup is discussed in detail to include a description of both the problem and recommended correction(s). Author (GRA)

N84-23352# Army DARCOM Materiel Readiness Support Activity, Lexington, Ky.

THE NEW MIL-STDs (MILITARY STANDARD) 1388 Final Report

J. E. PEER and D. L. MCCHRYSTAL / In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 334-339 1983

(AD-P002806) Avail: NTIS HC A24/MF A01 CSCL 15E

The concept for Logistics Support Analysis was originally set forth in MIL-STD-1388-1 published in October 1973. Since that time each service has pursued an independent course in the applications of LSA. DoD policies and directives for Integrated Logistics Support and LSA have changed to reflect refinements to an availability of analytical techniques developed to meet state-of-the-art hardware requirements. This paper describes the latest effort to provide a standard LSA with the broadest possible application. The recently published MIL-STD-1388-1A overcomes many shortcomings that were identified with the original military standard. It defines the LSA tasks in greater detail and provides the capability to tailor the level of effort for LSA to meet the specific requirements of any given acquisition program. Also discussed is a proposed version of MIL-STD-1388-2A, DoD

Requirements for a Logistic Support Analysis Record (LSAR). This document describes the data elements, definitions, and input data records for the DoD standard LSAR which is currently under development.
Author (GRA)

N84-23353# Army DARCOM Materiel Readiness Support Activity, Lexington, Ky.

CENTRAL DEMAND DATA BASE (CDDDB) END ITEM CODE (EIC) Final Report

G. CAMPBELL /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 341-344 1983

(AD-P002807) Avail: NTIS HC A24/MF A01 CSCL 15E

One of the most difficult tasks facing Army Logisticians is the accurate determination of the repair parts stockage levels to support the equipment in the hands of the soldier. Decisions on total repair parts consumption are based on demands, but repair parts for individual fielding of equipment in operational units are based upon estimates known as Failure Factors (FF's). These FF's established during the initial deployment of equipment are used throughout that equipment's life cycle. To update FF's, individual repair parts consumption must be identified to a specific end item application. The problem has been that there is no data source sufficiently reliable and valid to identify and collect data to update FF's. The End Item Code was designed to accomplish the identification and capture of individual repair parts consumption by specific end items, and provide the Army managers with an accurate record of repair parts consumption throughout the life cycle of an end item.
Author (GRA)

N84-23354# Logistics Management Inst., Washington, D. C.

IMPROVED MANAGEMENT OF SUPPORT RESOURCES Final Report

D. V. GLASS and D. W. SRULL /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 345-350 1983

(AD-P002808) Avail: NTIS HC A24/MF A01 CSCL 15E

Improving the management of support resources for major weapon systems is a crucial goal for the Department of Defense. The problem of weapon systems being inadequately supported in the field because of fragmented decision making in the allocation of support resources (e.g., spares, support and test equipment) was addressed in DoD Acquisition Improvement Initiative 30. New management procedures to help correct this problem were tested during the FY83 and FY84 budget reviews and the FY84-88 program review. In this paper we evaluate the test results in terms of the feasibility of identifying individual weapon system support resource needs, and the utility of collecting and reviewing this information during key points in the planning, programming and budgeting process. We then make several recommendations to improve the trial procedures and to move the initiative to final implementation.
Author (GRA)

N84-23355# Corpus Christi Army Depot, Tex.

PROJECT: ACQUISITION STRATEGY Final Report

W. D. MAJEWSKI /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 351-354 1983

(AD-P002809) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper describes a concept that is being observed with skepticism and an unwillingness to change that pervades throughout the management levels of the major procurement communities. This paper will discuss the trends of the outlying smaller procurement offices that directly support production facilities in the United States Army. The growth in central procurement that is evolving haphazardly is causing confusion throughout the procurement field. The principal elements that play a major role in this concept include, but are not limited to, delivery time, lead time, and general responsiveness on the part of the government; and speculative stocking, delivery time, lead time, cash flow, and investments on the part of the contractors/sellers. All of these elements play a formidable role in the recommendation to decentralization. This paper will discuss each of these items

and will provide an explanation where the elements have a staggering effect upon the readiness and hence responsiveness of the military.
GRA

N84-23371# Naval Electronic Systems Command, Washington, D. C.

MORTALITY AND SPAREPARTS: A CONCEPTUAL ANALYSIS Final Report

F. A. P. FRISCH /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 467-480 1983

(AD-P002826) Avail: NTIS HC A24/MF A01 CSCL 15E

The MORTALITY CONCEPT describes how a population deteriorates and what is needed to maintain a population. The populations considered are populations, or families, of spareparts needed to support military weapon systems. The mortality concept is explained and used to delineate the necessary resulting behavior of families of spareparts. The necessary behavior which follows is by necessity, from the selected MODE of acquisition (i.e., block-procurement) and from the selected QUALITY of the system. A generic model is sketched and sample calculations are provided to allow the reader to arrive at firm conclusions about the necessary behavior.
Author (GRA)

N84-23374# Air Force Contract Management Div., Kirtland AFB, N. Mex.

MATERIAL HANDLING: A TARGET FOR PRODUCTIVITY IMPROVEMENT Final Report

R. T. GIBBONS /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 490-494 1983

(AD-P002829) Avail: NTIS HC A24/MF A01 CSCL 05A

On a national basis, productivity improvement is needed to prevent inflation. Without improvements in productivity to counteract increases in wages, cost and prices, such increases lead to inflationary conditions. Air Force Contract Management Division, in a constant effort to protect the taxpayer dollar has initiated many programs such as Project Cost Initiatives which increases the depth of contractor surveillance. One of these initiatives, Material Handling Productivity improvement, has a basis in industry and has caught the interest of the academic community. With the help of these two functions, AFCMD has mounted a campaign to not only increase the awareness of the contractor's material handling function, but also to apply productivity improvement principals for the benefit of both Department of Defense contractors and the tax paying public at large.
GRA

N84-23379# Defense Logistics Agency, Alexandria, Va.

EMPLOYMENT CHANGES RESULTING FROM THE AWARD OF CONTRACTS IN LABOR SURPLUS AREAS Final Report

D. ROBINSON and D. GILL /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 517-525 1983

(AD-P002834) Avail: NTIS HC A24/MF A01 CSCL 15E

Until 1981, the Department of Defense (DoD), as a result of amendments to their annual Appropriations Acts (known as the Maybank Amendment), had been prohibited from setting aside procurement contracts for award in labor surplus areas (LSAs) in order to relieve economic dislocations. In 1981 a coalition of Northeast and Midwest Congressmen succeeded in having the Defense Logistics Agency (DLA) test a modification to the Maybank Amendment and measure the local employment effects of increasing DLA contract awards in LSAs. In order to assure reasonably accurate predictions of employment impacts due to the DLA Maybank Test, the U.S. Army Corps of Engineers Construction Engineering Research Laboratory developed a computer-assisted regional economic impact model (called the DLA Employment Impact System) to assist DLA with their Congressional requirement.
Author (GRA)

08 LOGISTICS AND OPERATIONS MANAGEMENT

N84-23380# Rome Air Development Center, Griffiss AFB, N.Y.
AUTOMATING THE SOURCE SELECTION PROCESS Final Report

J. M. BARRY and B. G. PRATT /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 527-528 1983
(AD-P002835) Avail: NTIS HC A24/MF A01 CSCL 15E

A typical source selection involves considerable administration which contributes to the consumption of program and staff office resources. Normally these resources are expended at the sacrifice of regular program office project activities since a permanent, dedicated source selection team is not cost effective. The loss to a program can be measured in terms of schedule delays, contractual gaps, and loss management control over existing programs. Therefore, the efficient and speedy conduct of a source selection is essential to the Acquisition Process. This efficiency cannot be achieved by shortcutting the required processes of source selection evaluation, analysis, and ranking. However, automating the administrative aspects of a source selection can result in a 30-50% reduction in time and resources required to evaluate the proposal. This paper will focus how this administration can and has been reduced on an existing Air Force Program through the use of microcomputers. Author (GRA)

N84-23381# Notre Dame Univ., Ind.

INCREASING THE CONTRACTOR/SUBCONTRACTOR/VENDOR BIDDING LISTS Final Report

J. G. BEVERLY, F. J. BONELLO, J. DASCHBACH, and W. I. DAVISSON /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 529-532 1983

(Contract F33615-82-C-5121)

(AD-P002836) Avail: NTIS HC A24/MF A01 CSCL 15E

Our intent in this paper is to demonstrate a method by which DoD (the Air Force) can increase the defense industrial base by increasing the list of companies that could bid on DoD vendor contracts as well as be available to bid on contracts from prime contractors. Our focus will be on small private business although the technique shown here could be applied to existing databases available for the establishments of SEC-registered corporations.

GRA

N84-23382# Naval Sea Systems Command, Washington, D.C.
SELECTION OF MULTIPLE SOURCES IN WEAPON SYSTEMS ACQUISITION Final Report

J. W. HARGROVE, JR. /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 533-536 1983

(AD-P002837) Avail: NTIS HC A24/MF A01 CSCL 15E

Discussion of source selection and evaluation techniques usually focus on selection of a single source to fulfill the government's weapon systems acquisition requirements. There are numerous instances when selection of multiple sources is an objective. The additional requirement to select multiple sources can greatly complicate the source selection process. Two major source selections conducted by the Naval Sea Systems Command for the Fast Logistic Ship SL-7 conversion (TAKRX) program and the Maritime Prepositioning Ship (TAKX) program illustrate techniques for selection of multiple sources in a highly complex situation. This paper discusses the significantly different procedures used in these two programs and identifies lessons learned. Selection of multiple sources requires considerable forethought to identify complicating factors and possible variations. Control of the number of variables is necessary to ensure a manageable process. Author (GRA)

N84-23664*# RAND Corp., Santa Monica, Calif.

A DEVELOPMENT OF LOGISTICS MANAGEMENT MODELS FOR THE SPACE TRANSPORTATION SYSTEM Final Report

M. J. CARRILLO, S. E. JACOBSEN, J. B. ABELL, and T. F. LIPPIATT Sep. 1983 98 p refs
(Contract NAS10-10438)

(NASA-CR-173504; NAS 1.26:173504; R-3083-NASA;

ISBN-0-8330-0529-4) Avail: NTIS HC A05/MF A01 CSCL 22A

A new analytic queueing approach was described which relates stockage levels, repair level decisions, and the project network schedule of prelaunch operations directly to the probability distribution of the space transportation system launch delay. Finite source population and limited repair capability were additional factors included in this logistics management model developed specifically for STS maintenance requirements. Data presently available to support logistics decisions were based on a comparability study of heavy aircraft components. A two-phase program is recommended by which NASA would implement an integrated data collection system, assemble logistics data from previous STS flights, revise extant logistics planning and resource requirement parameters using Bayes-Lin techniques, and adjust for uncertainty surrounding logistics systems performance parameters. The implementation of these recommendations can be expected to deliver more cost-effective logistics support.

R.S.F.

N84-25612# Naval Postgraduate School, Monterey, Calif.

NAVAL AVIATION IMA REPAIR CAPABILITY: A READINESS TO RESOURCES APPROACH M.S. Thesis

D. R. MERRILL Dec. 1983 103 p

(AD-A140465) Avail: NTIS HC A06/MF A01 CSCL 05A

This thesis studies intermediate repair planning at the Naval Air Systems Command (NAVAIR) level. Maintenance information system initiatives (Naval Aviation Logistics Command Management Information System (NALCOMIS)/Naval Aviation Logistics Data Analysis (NALDA)/AIMD Performance Management System (APMS) and an analytical systems model (Analytic Hierarchy Process (AHP)) are examined. The study concludes that information system initiatives provide the performance measurement orientation and information processing base required in support of NAVAIR tactical planning. It further concludes that complex logistics problems can be modeled through the AHP. AHP is a promising technique for integrating performance information and expert opinion into a hierarchical, multiple objective planning structure. It provides a method for determining resource requirement priorities in support of readiness goals. The study recommends that research be expanded to include development of a NAVAIR decision support framework utilizing the AHP.

GRA

N84-26460# Naval Postgraduate School, Monterey, Calif.

AN ANALYSIS OF NAVAL AVIATION CONFIGURATION STATUS ACCOUNTING M.S. Thesis

M. A. SNYDER and T. F. SNYDER Dec. 1983 125 p

(AD-A140473) Avail: NTIS HC A06/MF A01 CSCL 05A

Naval Aviation configuration status accounting and its interface with the present and future prescribed and locally developed information systems is reviewed. It was determined that the lack of coordination, integration and standardization resulting from the proliferation of locally developed systems decreases logistic support and maintenance management effectiveness. It is recommended that the prescribed Naval Aviation configuration status accounting system and the proliferation of local systems be consolidated into a single integrated system. NALCOMIS, a program currently under development, has the potential to meet all user requirements with minor expansion to its current design.

Author (GRA)

N84-26690# Electronic Systems Div., Hanscom AFB, Mass.

AN/TPN-19 IMPROVEMENTS PROGRAM MANAGEMENT PLAN

Feb. 1984 60 p

(AD-A140728) Avail: NTIS HC A04/MF A01 CSCL 17G

The purpose of the AN/TPN-19 Landing Control Central (LCC) is to provide a modern, reliable, air transportable terminal area

radar air traffic control system to perform effectively under conditions of heavy precipitation and high traffic density in support of world wide tactical operations. The AN/TPN-19 program resulted in the procurement of 11 systems: two prototypes refurbished to production configuration, and nine production units. The present program directs Air Force Systems Command (AFSC) to initiate a program to improve the operational effectiveness of the AN/TPN-19 LCC. Air Force logistics command (AFLC) is designated supporting command, Air Force communications command (AFCC) the operating command and Air Force operational test and evaluation center (AFOTEC) and Air training command (ATC) the participating commands. GRA

N84-26962# Selenia Industrie Associate S.p.A., Rome (Italy). Naval System Div.

THE LIFE CYCLE COST OF INTEGRATED LOGISTIC SUPPORT

U. G. FLORIO *In its Rivista Tec.* Selenia, Vol. 8, No. 1 p 1-5 1982 refs

Avail: NTIS HC A03/MF A01

Scheduling of preventive maintenance within the general context of the life cycle cost of integrated logistic support is discussed. The principal categories of support cost are considered and a procedure of optimizing the total cost for the evaluation of a fundamental logistic parameters is developed using Markov models. The Markov approach allows the examination of the functional relationships between system reliability, maintenance policies and the costs of integrated logistic support. The life cycle cost of the logistic support is optimized, and the results permit a correct cost/efficiency scaling of the support. Author (ESA)

N84-27587# Naval Postgraduate School, Monterey, Calif.

CONTRACT AUDIT FOLLOWUP: ITS IMPACT ON DEFENSE CONTRACTING M.S. Thesis

D. V. SMITH Dec. 1983 116 p

(AD-A140627) Avail: NTIS HC A06/MF A01 CSDL 05A

Department of Defense Directive 7640.2 Policy for the Followup of Contract Audit Reports, has created controversy both within DoD and the defense industry. Critics have claimed that the policy causes a fundamental shift in the relationship between the contracting officer and contract auditor, strengthening the auditor's role while eroding the independence and authority of the contracting officer. The available literature on the policy is highly subjective and consists primarily of the assertions of top management, both in government and industry, either supporting or denouncing the policy. The primary purpose of this study was to objectively investigate the specific claims of critics and to explore the overall impact of the followup policy on defense procurement. The thesis is based on an analysis of data collected from interviews of procurement managers, contracting officers, and auditors within the state of California and telephone discussions with procurement professionals nationwide. GRA

N84-27588# Analytics, Inc., Dayton, Ohio.

INCREASING COMPETITION FOR SPARES WITHIN AFLC (AIR FORCE LOGISTICS COMMAND) Interim Report, Jun. - Dec. 1983

T. M. MCCANN 30 Dec. 1983 110 p

(Contract F33615-82-C-5095)

(AD-A140751; BRMC-82-5095-4) Avail: NTIS HC A06/MF A01 CSDL 15E

The research was motivated by the need to improve the competitive position of Air Force Logistics Command and focuses on data problems which decrease competition. The ability to successfully breakout an item requires data and data rights to define the physical and functional attributes of parts, manufacturing techniques, and other information that permits a competent source to produce the part. Part 4 reviews information uncovered in Phase 2 and 3 and outlines recommendations concerning data rights, data management, management planning, and economic analysis done to complete an item. Author (GRA)

N84-28663# Notre Dame Univ., Ind.

INCENTIVE CONTRACTS AND COST GROWTH Final Report, 1980 - 1983

J. J. KENNEDY 31 Oct. 1983 18480 p

(Contract F33615-80-C-5103)

(AD-A140930; BRMC-80-5103) Avail: NTIS HC A21/MF A01 CSDL 05A

This study has been conducted for the Air Force Business Research Management Center at Wright-Patterson Air Force Base, in Dayton, Ohio (AFBRMC). It has consisted of three phases. Phase one was a literature search and documentation. Interviews were also conducted with key government and industry personnel. Phase two included the development and the distribution of a questionnaire to the NCMA membership. A series of small conferences with industry and government personnel, and a pilot study of several companies. The pilot study was designed to assess what companies actually do or do not do once an incentive contract was obtained. Phase three compiles and presents the final conclusions and recommendations. GRA

N84-28671# Naval Postgraduate School, Monterey, Calif.

THE DATABASE MANAGEMENT MODULE OF THE SPLICE SYSTEM

E. J. DIXON Jun. 1983 58 p refs

(AD-A132795) Avail: NTIS HC A04/MF A01 CSDL 15E

SPLICE (Stock Point Logistics Integrated Communications Environment) is a plan designed to automate data handled at Stock Points and Inventory Control Points for the United States Navy Supply System. The SPLICE concept involves the use of a number of Local Area Networks which communicate via the Defense Data Network. As a part of the ongoing research in the implementation of SPLICE, this (Continued) thesis addresses the Database Management Module of the Local Area Network and possible problem areas which may be encountered when this module is finally in place. A proposed conceptual design of the database is presented and database computers are evaluated for possible use in SPLICE. GRA

N84-29788# Notre Dame Univ., Ind. Dept. of Economics.

EVALUATING THE AVAILABILITY, ROLE, AND PERFORMANCE OF SUBCONTRACTORS IN THE AEROSPACE INDUSTRY Final Report, 27 Sep. 1982 - 30 Jan. 1984

J. G. BEVERLY, F. J. BONELLO, J. DASCHBACH, and W. I. DAVISSON 15 Jul. 1983 187 p

(Contract F33615-82-C-5121)

(AD-A141408; BRMC-82-C-5121) Avail: NTIS HC A09/MF A01 CSDL 05A

This study examines the feasibility of developing a subcontractor database for use in industrial base identification and planning, and of the prime contractor decision to make or buy components from firms in the subcontract/vendor private portion of the defense industrial base. The project has three tasks: to identify aerospace subcontractors, to investigate databases on privately held firms and to examine prime contractor decisions to make or buy components from subcontractors or vendors. Beyond these three specific defined tasks, production base analysis is discussed as it relates to the consideration of databases, establishments and enterprises and make-or-buy decisions. Two points should be emphasized. First, there are strong parallels in the conceptual framework of production base analysis and acquisition planning. For both production base analysis and acquisition planning, it is most useful to take a broad, economy-wide perspective to industrial base considerations. Second, the demands for data are similar as well: production base analysis and acquisition planning both require product and production information. Both can be made more effective if supplemented with financial information. At the present time the same kinds of data limitations that constrain acquisition planning also constrain production base analysis. To this end, efforts to obtain more and better product, production and financial information for both public and private firms will provide dividends in a variety of areas. GRA

08 LOGISTICS AND OPERATIONS MANAGEMENT

N84-29848# Bell Telephone Labs., Inc., Greensboro, N. C. Federal Systems Div.

STUDY OF THE FAA (FEDERAL AVIATION ADMINISTRATION) PROGRAM TO MODERNIZE MAINTENANCE OPERATIONS
Engineering Report, Oct. 1983 - Apr. 1984

P. F. SENNEWALD, H. W. GUSTAFSON, and P. B. TAYLOR
Washington, D.C. FAA May 1984 60 p
(Contract DTFA01-84-C-0010)
(AD-A142295; DOT/FAA/ES-83/12) Avail: NTIS HC A04/MF A01 CSCL 05A

This report is an evaluation of the FAA's program to modernize the National Airspace System and reduce maintenance and operation costs through replacement of present systems with state-of-the-art equipment, centralization of the maintenance work force and remote monitoring of equipment/facilities. A conclusion of the study was the FAA's Maintenance Program which is a viable approach to meeting these goals. The AT&T study team made seven recommendations they believed would ensure improved productivity and reduced operating costs. The objectives of the AT&T study were to evaluate the FAA's modernization program, and then, based on AT&T's experience in their modernization effort, make recommendations to improve the FAA's program. The recommendations can be generalized into three areas which are: (1) Separate the monitoring and control of facilities from the automation and centralization of operations, thereby enabling independent efforts in those areas, (2) Establish an overall program management plan, and (3) Establish a model for centralization of the work force in the automated environment.

Author (GRA)

N84-31033# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.

AIR FORCE TECHNICAL OBJECTIVE DOCUMENT FY 85
Technical Report

R. L. DENISON Dec. 1983 57 p Supersedes N83-26783;
AFWAL-TR-82-4201
(AD-A141925; AFWAL-TR-83-4000; AFWAL-TR-82-4201) Avail:
NTIS HC A04/MF A01 CSCL 05A

This Technical Objective Document was prepared by the Materials Laboratory and describes the Materials Technology Planning Objectives (TPOs) for meeting future Air Force operational needs. The six TPOs encompass the full spectrum of materials capabilities required for future aircraft, missile, space, and electronic systems-Thermal Protection Materials; Aerospace Structural Materials; Aerospace Propulsion Materials; Fluid, Lubricant, and Elastomeric Materials; Protective Coatings and Materials, and Electromagnetic Windows and Electronics.

GRA

N84-31107# Engineering and Economics Research, Inc., Vienna, Va.

NATIONAL AIRSPACE REVIEW: IMPLEMENTATION PLAN

Washington Federal Aviation Administration Jun. 1984 51 p
refs Sponsored by Federal Aviation Administration
(AD-A145379) Avail: NTIS HC A04/MF A01

Activities of the National Airspace Review (NAR) are examined. Using a synergistic approach, the NAR is comprehensively reviewing current air traffic control procedures, flight regulations, and airspace for the purpose of validating the current system or identifying near term changes which will promote greater efficiency and provide the operational framework for moving into the next generation National Airspace System. Specifically, purposes of the NAR are: (1) Conduct an in depth study of airspace and procedural aspects of the existing air traffic system. (2) Identify and implement changes that will promote greater efficiency for all airspace users. (3) Simplify the Air Traffic Control system. (4) Match airspace and air traffic control procedures to technological improvement and fuel efficiency programs.

M.A.C.

N84-32230# Singer Co., Binghamton, N.Y. Link Flight Simulation Div.

A COMPARISON OF SIMULATOR PROCUREMENT/PROGRAM PRACTICES: MILITARY VERSUS COMMERCIAL

J. S. HUSSAR In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 47-59 16 Nov. 1983
(AD-P003453) Avail: NTIS HC A17/MF A01 CSCL 05A

The costs of complex military flight simulators have been steadily rising, causing all concerned to carefully evaluate procurement and life-cycle costs of these devices. In making these evaluations, the issue is often raised that commercial airline simulators of comparable quality can be procured for less money and with shorter schedules. This paper provides a comparison of military and commercial procurement methods, concentrating on the major differences between them. It analyzes the key discriminators between military and commercial contract requirements which collectively cause simulator procurement and program practices to be so different, and costs to vary so widely, when the resultant flight simulators procured by both methods are highly regarded for their training capabilities. Recognizing that some of the military requirements are unique and necessary, this paper takes the position that military simulator procurement can utilize some of the methods employed in commercial procurements to reduce life-cycle costs.

Author (GRA)

N84-32239# Singer Co., Binghamton, N.Y. Link Flight Simulation Div.

EFFECTIVENESS OF MULTI-YEAR AND ADVANCE PROCUREMENT CONTRACTS

F. S. BELYEA In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 115-117 16 Nov. 1983
(AD-P003462) Avail: NTIS HC A17/MF A01 CSCL 05A

Experience gained from the use of Multi-year and Advance Procurement contracts under the new regulations has proven that, within some restrictions, they have been beneficial to industry as well as cost effective for the Government. In a typical example, over 30% cost benefit over an annual procurement has been realized in acquisition and early delivery of training devices. The experience demonstrates the utility and adaptability of these regulations that can be attained through aggressive and innovative use. Additional changes and use of the regulations and uniform policies implementing the regulations would provide more frequent use of these procurement types.

GRA

N84-32240# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

MANAGING AIRCRAFT/SIMULATOR CONCURRENCY

R. W. BECK and J. C. CLARK In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 118-122 16 Nov. 1983
(AD-P003463) Avail: NTIS HC A17/MF A01 CSCL 15E

Concurrency is the word being used to describe the situation when a simulator or other aircrew training devices are required for delivery at the same time as the new aircraft it will support. If traditional acquisition approaches are applied to concurrent aircraft and simulation programs, it is practically impossible, in many cases, to deliver a fully capable aircrew training device anywhere near the Initial Operational Capability (IOC) of the aircraft. This is especially true when dealing with aircrew trainers for a complex tactical or strategic weapon system. Using the B-1B Simulator System program as an example, this paper discusses the risks and management challenges involved with concurrency and an innovative acquisition strategy designed to ensure the availability of aircrew training devices at or before the aircraft IOC. Included in this strategy are: (1) a new approach to preparation of the request for proposals documentation, (2) a competitive preliminary design effort, (3) methods for dealing with the acquisition of simulator design data, (4) the concept of providing the user a limited (interim) training capability early in the program, (5) management of a configuration baseline which evolves along with

the simulator design, and (6) retrofit/update of all delivered devices to the final aircraft configuration. GRA

N84-32259# General Electric Co., Daytona Beach, Fla.
THE PROGRAM PLANNING REVIEW (PPR): MILESTONE OR MILLSTONE?

R. B. WALKER and R. E. DENEZZA (ASD) /In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 339-342 16 Nov. 1983 (AD-P003493) Avail: NTIS HC A17/MF A01 CSCL 05A

Current Air Force practices invoke the Program Planning Review (PPR) and its associated data submissions and review meetings on all new simulator procurements. The PPR, as defined by Air Force policy, provides both the contractor and Air Force program offices with insight into the program plans to insure successful completion of all contract objectives. This paper summarizes the successful completion of the PPR requirements on a current Air Force simulator contract where proper preparation and implementation of the program plans by the contractor, and prompt, explicit review by the government, resulted in a program baseline which has met all cost and schedule objectives to date. GRA

N84-32262# Burtek Corp., Tulsa, Okla.

LOGISTIC SUPPORT: A COMPUTER MANUFACTURER'S VIEWPOINT

G. T. MCCASKILL /In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 356-362 16 Nov. 1983 (AD-P003496) Avail: NTIS HC A17/MF A01 CSCL 15E

When the Department of Defense directed that commercially available standard off-the-shelf computer systems would be used for military simulation programs in place of special militarized computers the intent was clear: Cut costs! Now, more than a decade after that DoD directive, it is possible to look back, recognize the value of the decision, and identify many of the problem areas that have been created for the military simulation program organizations. The military services have attempted to address the problems posed by the apparent conflict of needs but have met with minimal success to date. This paper is a computer manufacturer's look at some of the support problems that have been created by the use of commercially available computer systems, some of the solutions that have been considered, and some actions that should be explored if resolutions to the problems are to be achieved. Author (GRA)

N84-32296# Oak Ridge National Lab., Tenn. Energy Div.

AN EVALUATION OF THE SYSTEM 2000 DATA BASE MANAGEMENT SYSTEM FOR USE IN MAJOR ITEM SYSTEM MAPPING

L. D. DUNCAN, B. S. TAYLOR (Lockheed Oak Ridge Engineering Co.), and J. P. TOMLINSON (Lockheed Oak Ridge Engineering Co.) Jun. 1984 69 p refs (Contract DE-AC05-84OR-21400) (DE84-013130; ORNL/TM-9232) Avail: NTIS HC A04/MF A01

The study compares the short and long term requirements of the Major Item System Mapping (MISM) computer software system with the capabilities of the System 2000 data base management system. The MISM system is intended to provide a system oriented approach for budgeting and managing major items of equipment. Both the hardware resource requirements and software features of System 2000 were evaluated. DOE

N84-33067# Urban Mass Transportation Administration, Washington, D.C. Methods Div.

MICROCOMPUTERS IN TRANSPORTATION: SOFTWARE AND SOURCE BOOK

Sep. 1983 146 p refs Prepared in cooperation with FHA, Washington, D.C. (PB84-195155; UMTA-URT-41-83-11) Avail: NTIS HC A07/MF A01 CSCL 09B

The Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA) of the U.S. Department of Transportation provide training and technical assistance in the

new and rapidly changing area of transportation application of microcomputers. These two agencies maintain up-to-date microcomputer references for transit and paratransit operators, transportation planners, and traffic engineers. This document contains information pertaining to: (1) microcomputer references and training, and; (2) descriptions of software in the areas of transit operations, transportation planning, traffic engineering, and paratransit planning and operations. GRA

N84-33290# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

AN EVALUATION OF TWO RELIABILITY AND MAINTAINABILITY INFORMATION SYSTEMS M.S. Thesis

L. K. BOCK Jan. 1984 72 p (AD-A143438; AFIT-LSSR-66-83) Avail: NTIS HC A04/MF A01 CSCL 09B

Air Force managers require adequate and timely information in order to make effective decisions regarding reliability and maintainability (R&M) issues. Since 1980, at least two Air Force organizations have contracted for additional computer data base systems to improve their R&M data requirements. These data base systems provide real-time maintenance and operational data on certain weapons systems. This study analyzed the output characteristics of these new data base systems to determine if they did provide improved information and comparison with the standard Air Force maintenance and operational data reports. It was shown that the two new data base systems did provide more timely R&M data which resulted in information that allowed for effective and efficient managerial decision making. However, all the timely information available for managerial decisions will be hindered until data input errors are reduced. Author (GRA)

N84-33308# Regional Planning Council, Baltimore, Md.

SCENARIO PLANNING: ENERGY CONSIDERATIONS IN THE LONG RANGE URBAN TRANSPORTATION PLANNING PROCESS

May 1983 253 p refs (Contract DE-AI01-81CS-90103) (DE84-013590; DOT-I-83-20) Avail: NTIS HC A12/MF A01

The incorporation of energy conservation in regional planning framework was studied. The scenario technique is a comprehensive approach which considers the interaction of energy issues with transportation and other planning concerns such as land use, technological change, and economic development. The project created several hypothetical futures typified by varying levels of oil availability, and constructed sets of policy responses designed to deal with the problems typifying those future conditions. Unique insights are gained which could not have emerged in the course of more conventional planning. DOE

N84-33366# Naval War Coll., Newport, R. I. Dept. of Naval Operations.

AVCAL (AVIATION CONSOLIDATED ALLOWANCE) RESTORATION PROGRAM AND AIRCRAFT MATERIAL CONDITION

B. H. WELCH, III 22 Jun. 1984 40 p (AD-A144045) Avail: NTIS HC A03/MF A01 CSCL 05A

The direct relation between spare parts and aircraft material condition is intuitively obvious, but forecasting what a given finding of spare parts will produce in terms of aircraft readiness has previously been more art than science. The Aviation Consolidated Allowance (AVCAL) Restoration Program, a \$2.3 billion funding of repairable spare from FY 81 to FY 89, was originated by the Aviation Supply Office (ASO) to correct present spare parts deficiencies. A thorough review of the AVCAL Restoration Program (ARP) describes the various spare parts initiatives underway, after an overview of the current aviation supply system demonstrates the value of stressing repairable spare parts deficiencies. While the ARP was coming into being, the Center for Naval Analyses (CNA) has provided the quantification of the relation between spare parts and aircraft material condition. The CNA model will be described and used to estimate the effect of the ARP. GRA

N84-34425# Joint Publications Research Service, Arlington, Va. **IMPROVEMENTS IN WORK OF AIRCRAFT REPAIR PLANT NO. 402**

I. VOLKOV *In its* USSR Rept.: Transp. (JPRS-UTR-84-027) p 8-10 24 Sep. 1984 Transl. into ENGLISH from Vozdushnyy Transp. (Moscow), 12 Jun. 1984 p 2
Avail: NTIS HC A04

Working conditions and accomplishments in an aircraft repair plant are discussed. Production effectiveness and work quality in the repair of engines for aircraft, cargo liners, and helicopters are outlined. Increasing labor productivity is emphasized. E.A.K.

09

RELIABILITY AND QUALITY CONTROL

Includes Fault Tolerance, Failure and Error Analysis, Reliability Engineering, Quality Assurance, Wear, Safety Management and Safety, Standards and Measurement, Tests and Testing Inspections, Specifications, Performance Tests, Certification.

A84-10026#

APPLICATION OF SOFTWARE ENGINEERING STANDARDS - A REPORT ON THE STATE OF THE ART

J. R. BROWN (Boeing Computer Services Co., Seattle, WA) IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1983, p. 178-181. (AIAA PAPER 83-2356)

A84-10027#

HUGHES' SOFTWARE ENGINEERING PROCEDURES IMPROVE QUALITY - DO THEY HELP PRODUCTIVITY?

P. A. MAURO and J. J. DE LEO (Hughes Aircraft Co., Fullerton, CA) IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1983, p. 182-186. (AIAA PAPER 83-2357)

The development and implementation of a software engineering procedures notebook (SEPN) by the Hughes Aircraft Company Software Engineering Division is discussed in terms of its effects on product quality and personnel productivity. Since 1978, about 15,700 hours have been expended by 93 project supervisors to generate 71 procedures totaling 1500 pages, with further effort necessary to review and update the procedures. Although quantitative measures of quality and productivity are not available, it is concluded that SEPN has a positive effect on quality which, by reducing the number of corrective tasks, more than offsets the productivity costs of generating and maintaining the SEPN and of some personnel resistance to the procedures. The latter problem is considered in detail, and it is recommended that future programs like SEPN aim for sound justification, bottom-up generation, trial implementation, tailorability, conciseness, and frequent updating of the procedures to assure personnel acceptance and implementation. T.K.

A84-10028#

ISSUES AFFECTING SOFTWARE STANDARDS TO ENSURE QUALITY AND PRODUCTIVITY

S. A. STEELE (RCA, Government Systems Div., Moorestown, NJ) IN: Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1983, p. 187-191. refs (AIAA PAPER 83-2358)

The issues associated with achieving quality with accompanying high productivity in product software development are discussed. Quality and productivity are often opposing factors, and in the real world a compromise is required between quality and productivity. Issues identified relate to management's role, the

designer's role, and the tester's role in quality production. In addition, emphasis is placed on the view of the development process itself from the manager's and designer's perspective. Innovative development techniques are discussed, along with an assessment of present standards and present approaches. Heavy emphasis is placed on senior management's view of risk assessment in accomplishing large-scale software development tasks. A matrix indicates items to consider for risk analysis.

Author

A84-12356#

PLANNING FOR RELIABILITY GROWTH

D. B. YOUNG and D. G. ROBINSON (USAF, Operational Test Center, Kirtland AFB, NM) AIAA, AHS, IES, SETP, SFTE, and DGLR, Flight Testing Conference, 2nd, Las Vegas, NV, Nov. 16-18, 1983. 7 p. refs (AIAA PAPER 83-2776)

This paper discusses fundamental concepts of reliability growth plans. Government policy surrounding reliability growth management is presented along with growth curve models for use during development and operational test phases. It is found that proven growth planning techniques are available and their use aids in monitoring the achievement of operational reliability requirements.

Author

A84-15208

RELIABILITY PROGRAM DEVELOPMENT AND IMPLEMENTATION FOR A REMOTE PILOTED VEHICLE

S. SAMUEL (Israel Aircraft Industries, Ltd., Lod, Israel) and Y. TAMIR (Staten Island, College, Staten Island, NY) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 230-235.

The implementation of a reliability program is described in terms of the application in the development of a remotely piloted vehicle (RPV) by the Israel Aircraft Industries. The reliability group was responsible for reliability, maintainability, component standardization, failure reporting, analysis and corrective action, software reliability and quality, and prototype quality assurance. The reliability group became involved during feasibility analysis with small models, and studied the life cycle costs (LCC) and features of a minimum-cost RPV and an optimized RPV. Increasing the RPV cost and reliability was found to reduce ground support and maintenance costs. The reliability group performed thorough mechanical and electrical design reviews at all stages of development, and also tested manufacturers' parts before installation whenever possible. A master plan is provided for project product assurance.

Author

A84-15209

RELIABILITY PROGRAMS FOR COMMERCIAL COMMUNICATION SATELLITES

F. E. ERDLE, I. A. FEIGENBAUM, and J. W. TALCOTT, JR. (COMSAT Laboratories, Clarksburg, MD) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 236-239.

This paper describes reliability programs that are in use for commercial communication satellites. Environmental conditions are presented along with system concerns and design constraints. Significant procurement policy factors are pointed out, including the development of a request for proposal, contractual provisions, on-site representation of the procuring organization at prime contractor and other facilities, and incentive provisions in contracts. The implementation of procurement policies is discussed from an historic perspective with reference to a present-day list of salient plan elements and experiences that inspired the invoking of these elements. Some of the payoffs of reliability program efforts are mentioned. While the complexity of commercial communications satellites has been increasing, high system reliability has been maintained. As an example, the continuity of service for the Intelsat space segment has been greater than 0.99995 since 1970. This has been achieved largely through effective reliability programs that have been based on conservative design techniques and stringent product assurance requirements.

Author

A84-15211**MANAGERIAL DECISION-MAKING IN ESTABLISHING R&M DESIGN GOALS**

A. F. CZAJKOWSKI (Clemson University, Clemson, SC) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 253-258. refs

The concepts of operational capability and life-cycle cost are used to develop a managerial decision model for establishing design goals for system reliability and maintainability (R&M), and the apportionment of these goals to subsystem design levels, during the conceptual phase of system development. The model uses experience, engineering judgment, etc., to provide input data on attainable R&M levels and the programs required for achieving them. Solving the model allocates effort where the results are best according to a life-cycle cost objective function which reflects managerial aversion to cost and risk. Specifically, the model (with the solution technique) provides program managers a systematic approach for establishing R&M design goals when: (1) attainable R&M levels are not known with certainty; (2) costs are not known with certainty; (3) limited funds are available for system development; (4) constraints exist on at least some of the following factors: system availability, weight, and R&M; (5) some R&M alternatives are interdependent; and (6) the suitability of establishing R&M design goals depends on both cost and risk considerations. Utility of the model for R&M program decision making is demonstrated by applying it to the analysis of a system with 20 subsystems, each of which has a maximum of 9 possible R&M combinations. Author

A84-15216**OPTIMUM WARRANTY POLICIES FOR NONREPARABLE ITEMS**

M. U. THOMAS (Cleveland State University, Cleveland, OH) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 282-288. refs

An approach is presented for establishing and evaluating warranty policies for products receiving renewable warranties when failure occurs during warranty. A general rebate model is described that allows total compensation to a consumer for failures during a fixed period and prorated compensation for a remaining interval of time. Associated warranty costs are weighed against the s-expected benefit to be derived from the program. Conditions for optimum warranty intervals are provided. Closed form results are given for exponentially and uniformly distributed failure times. The more complicated case of Weibull failure times is demonstrated by example. A sensitivity analysis of the parameters is included. Author

A84-15217**SOFTWARE CONFIGURATION MANAGEMENT AND ITS CONTRIBUTION TO RELIABILITY PROGRAM MANAGEMENT**

R. FOULKES and M. P. MILLS (YARD, LTD., Glasgow, Scotland) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 289-292.

A brief introduction describes the characteristics of configuration management and outlines the key issues of knowledge and control of content, along with the targets developed for configuration management. Software, as a relatively new discipline, is still evolving standard techniques. The special properties of software which cause difficulty in configuration management are discussed. The theme moves to the planning of configuration management in order to support the reliability program. While many organizations consider configuration management at the end of development, the reasoning and recommendations (based on experience) are given for applying configuration management during the entire development and life of a project. The paper shows how to implement software configuration management and describes the method used in YARD. It concentrates on the view of the system by all users, and the impact on the ability to send software to customers with confidence, keep track of reported defects, and trace the effect of modifications on all issued software. The software configuration control system is the foundation on which all reporting systems must be based. It is an entirely different

matter accumulating and analyzing failure reports on some object like a pressure transducer, the configuration control for which is easily identified, than a large software-based system undergoing continual evolution and correction. The use of computers to maintain configuration control discipline on software is essential and, in our experience, works. Author

A84-15218**SOFTWARE PERFORMANCE MODELING AND MANAGEMENT**

D. J. SIMKINS (IBM Corp., Federal Systems Div., Owego, NY) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 293-298. refs

The measurement and management of the effect of software on the reliability and operability/suitability of U.S. weapon systems are discussed. A system reliability model for determining the software failure count during the system proof-of-compliance testing is developed for management overview of software suitability. Management actions are recommended for correcting deficiencies in both military and industrial applications. The activities include assessment of system reliability, setting provisions for software quality, and providing full human factors support, the latter being significant in performing a user-oriented system analysis when system operational requirements have been defined. Attention is focused on software due to the ease of corrections that can be made in software, relative to the costs involved in correcting hardware. The emphasis is on optimization of the man/machine interface. M.S.K.

A84-15219**MANAGING TEST-PROCEDURES TO ACHIEVE RELIABLE SOFTWARE**

P. KUBAT and H. S. KOCH (Rochester, University, Rochester, NY) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Aug. 1983, p. 299-303. refs

Quantitative decision-making procedures are proposed to aid software project managers to manage effectively the testing stage during software project development. The module and integration testing phases are thoroughly investigated. Decision procedures which maximize the reliability and/or minimize some cost-benefit objective subject to a time and/or budget constraint are suggested. These procedures optimally allocate test time to the modules for module testing and select the optimal data mixture for integration testing. Testing of computer software is a major component of the software development effort. An efficient allocation of computer time among various modules during testing can appreciably improve reliability and shorten the testing stage. Using decision models presented in this paper, a project manager can effectively allocate test time during module testing and select the best data mixture for integration testing. The models are based upon software failure data that are collected during testing. These decision models can be valuable not only for the project manager but for the group responsible for generating the appropriate test data. Author

A84-15310**MANAGEMENT OF LARGE SPACE PROJECTS - QUALITY ASSURANCE OR 'PRODUCT ASSURANCE' [GESTION DES GRANDS PROJETS SPATIAUX - ASSURANCE DE LA QUALITEOU 'ASSURANCE PRODUIT']**

A. DE CACQUEREY (Matra, S.A., Toulouse, France) IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings. Toulouse, Cepadues-Editions, 1983, p. 287-320. In French.

Quality assurance comprises predefined procedures for obtaining products which meet all flight, ground, testing, environmental, and performance specifications. Products for space use are usually not production line items and therefore must be built right the first time, with testing covering all mechanical, electrical, thermal, radiation, and interface performance components. A large amount of written documentation becomes necessary in order to trace the progress of development of all subsystems and ameliorate any adverse effects due to the differing motivations of the industrial sector and other participants engaged in the enterprise. Product assurance is constrained by the large

09 RELIABILITY AND QUALITY CONTROL

number of interfaces within both the product, which may originate from off-the-shelf, original, and modified designs with subsystems manufactured in diverse places, and the organizations participating in the project. M.S.K.

A84-15597

R&D AND QUALITY ASSURANCE PARTNERSHIP

H. J. KOHOUTEK (Hewlett-Packard Co., Fort Collins Systems Div., Fort Collins, CO) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-30, Nov. 1983, p. 200-204. refs

Complex R&D programs, such as end product oriented VLSI development, require utilization and integration of teams consisting of individuals representing a wide variety of different areas of expertise. VLSI development and pilot manufacturing, particularly, require dimensional and material quality control expertise not usually found in computer product or process design laboratories. The needed expertise can be provided by a highly professional quality assurance team equipped with state-of-the-art analytical instrumentation. Its integration into the total program team with additional program and market-oriented objectives can provide an increased overall effectiveness. The integrated team conditions stimulate creativity and leadership in all areas of expertise and improve the quality assurance team acceptance by other organizational units, even those not associated with the project. Successful experience with the combined team strategy, as applied during the Hewlett-Packard 32-bit VLSI development program, is described here in terms of the program environment, conditions leading to the decision to invite the quality assurance team to participate, changes introduced, and specialized knowledge contributed. Results of this strategy are evaluated in the context of program and project management. Author

A84-24450#

SOFTWARE ENGINEERING PROJECT STANDARDS

M. BRANSTAD and P. B. POWELL (National Bureau of Standards, Institute for Computer Sciences and Technology, Washington, DC) IEEE Transactions on Software Engineering (ISSN 0098-5589), vol. SE-10, Jan. 1984, p. 73-78. refs

The treatment of software engineering project standards (SEPS) and their importance begins with a general discussion of standards. After defining SEPS, issues relating to the selection, support, and use of SEPS are considered, and trends are delineated. A brief overview is given of existing software engineering standards. The emphasis on software engineering standards is expected to continue, with global software engineering standards being established. The trend toward standardizing parts of the software development process will be motivated in part by the use of automation to support this development process. C.R.

A84-41079

THE AVIATION SAFETY ANALYSIS SYSTEM (ASAS) - AN OVERVIEW

W. R. FROMME (FAA, Washington, DC) IN: Behavioral Objectives in Aviation Automated Systems Symposium; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 25-28, 1982. Warrendale, PA, Society of Automotive Engineers, Inc., 1982, p. 279-283.

The Federal Aviation Administration's Aviation Safety Analysis System (ASAS), which is a comprehensive new system to upgrade significantly the agency's ability to collect, process, and disseminate safety-related information, is described. Five selected prominent data systems slated for inclusion in ASAS are listed and briefly described. C.D.

N84-11048# Department of Defense, Washington, D. C.

BOTTOM LINE ACADEMIA CONFERENCE Final Report

24 Jun. 1983 105 p Conf. held at Washington, D.C., 28 Apr. 1983

(AD-A131043) Avail: NTIS HC A06/MF A01 CSCL 05A

Initiatives which the academic community could take to meet industry and DoD needs for the improved application and management of the quality functions are explored. The necessity of improving the image of quality in industry for both competitive

and economic reasons, thus assuring the readiness of defense forces is highlighted. The role academia could play in restructuring curricula include more quality management courses in preparing future industrial leaders are discussed as being the possible catalyst in returning America to the forefront in quality. J.M.S.

N84-11778# Rome Air Development Center, Griffiss AFB, N.Y. THE EVOLUTION AND PRACTICAL APPLICATIONS OF FAILURE MODES AND EFFECTS ANALYSES

H. B. DUSSAULT Mar. 1983 114 p refs

(Contract AF PROJ. 2338)

(AD-A131358; RADC-TR-83-72) Avail: NTIS HC A06/MF A01 CSCL 09B

Failure effects analysis allows a product to be studied early in its design and development stages where undesirable failure effects can be identified and readily corrected. This report is intended to give the reader a broad, general background in techniques available for failure effects analysis and their usefulness. Sixteen separate techniques, ranging from tabular failure modes and effects analysis and fault tree analysis to lesser known and more recently introduced techniques such as hardware/software interface analysis, are discussed. The current status and prospects for the future failure effects analysis are also discussed in the report. GRA

N84-12510# Hanford Engineering Development Lab., Richland, Wash.

QUALITY IS NOT A DIRTY WORD

V. A. COSTON 1983 6 p Presented at the Am. Soc. for Quality Control Conf., Richland, Wash., 17-19 Apr. 1983

(Contract DE-AC06-76FF-02170)

(DE83-012166; HEDL-SA-2890-FP; CONF-830475-2) Avail: NTIS HC A02/MF A01

There is a great deal of emphasis today on management's commitment to quality. Yet with all the hue and cry about this commitment do we find much more happening than just lip service. Are quality professionals aiding and abetting the nonacceptance of quality organizations, resulting in their exclusion from the management. Quality professionals must recognize they cannot divorce themselves from cost and schedule. They must recognize they are not policemen with omnipotent authority. Self-recognition must occur and be acted upon for changes in attitudes and opinions of others to be affected. There are, of course, other factors involved. But in searching for the root cause of the problem, does the evidence of those other factors again point back to the Quality professionals. Quality is not a dirty word. We must convince ourselves before we can convince others. DOE

N84-13014# Pacific Northwest Lab., Richland, Wash.

MANAGEMENT OF QA IN AN R AND D ORGANIZATION

D. E. RYDER Jun. 1983 7 p refs Presented at the 37th Ann. Am. Soc. for Quality Control Congr., Boston, 24-26 May 1983

(Contract DE-AC06-76RL-01830)

(DE83-016924; PNL-SA-10382; CONF-830535-3) Avail: NTIS HC A02/MF A01

Application of more formal QA-system principles and practices are slowly but surely becoming a fact of life for many of the nation's R and D organizations. As an example, the US Department of Energy (DOE) in 1981 issued an order to its field offices that involved requirements for the assurance of quality achievement in DOE programs. This paper will provide useful information based upon actual experience in the development and implementation of an R and D QA Program at a national laboratory. It will include a discussion of the R and D product (data), primary QA concerns, management of the QA program and QA organization, QA planning, and contributions that QA personnel can make to the R and D effort. DOE

N84-14528# Eagle Technology, Inc., Arlington, Va.
RELIABILITY PROGRAMS FOR NONELECTRONIC DESIGNS,
VOLUME 2 Final Technical Report, 1 Sep. 1981 - 31 Aug. 1982

W. H. SKEWIS Griffiss AFB, N.Y. RADC Apr. 1983 74 p 2 Vol.

(Contract F30602-81-C-0190; AF PROJ. 2338)
 (AD-A133625; RADC-TR-83-85-VOL-2) Avail: NTIS
 HCA04/MFA01 CSCL 14D

Current military standards for reliability programs, reliability predictions and qualification testing were written primarily for electronic equipment where component standardization and the valid assumption of an exponential failure rate permit their direct application. These electronic systems, however, often contain nonelectronic assemblies that are critical to operational readiness, mission success or logistics support. Application of current standards to nonelectronic designs depend upon the type equipment being developed, previous applications experience, quantity of equipment to be produced and many other factors. To help identify these characteristics and formulate a set of criteria on which to base recommendations, the Rome Air Development Center distributed over 400 questionnaires throughout the Department of Defense and related industries. Volume II emphasizes the distinguishing characteristics of nonelectronic designs and provides guidelines for tailoring current reliability documents to nonelectronic designs with consideration given to mission criticality, development phase, program dollars, development time and other program constraints. GRA

N84-14529# Eagle Technology, Inc., Arlington, Va.
RELIABILITY PROGRAMS FOR NONELECTRONIC DESIGNS,
VOLUME 1 Final Technical Report, 1 Sep. 1981 - 31 Aug. 1982

W. H. SKEWIS and W. C. MANGUM Griffiss AFB, N.Y. RADC Apr. 1983 135 p 2 Vol.

(Contract F30602-81-C-0190; AF PROJ. 2338)
 (AD-A133624; RADC-TR-83-85-VOL-1) Avail: NTIS
 HCA07/MFA01 CSCL 14D

Current military standards for reliability programs, reliability predictions and qualification testing were written primarily for electronic equipment where component standardization and the valid assumption of an exponential failure rate permit their direct application. These electronic systems, however, often contain nonelectronic assemblies that are critical to operational readiness, mission success or logistics support. Application of current standards to nonelectronic designs depends upon the type equipment being developed, previous applications experience, quantity of equipment to be produced and many other factors. To help identify these characteristics and formulate a set of criteria on which to base recommendations, the Rome Air Development Center distributed over 400 questionnaires throughout the Department of Defense and related industries. Volume I of this report summarizes the results of the survey on reliability programs for nonelectronic designs. Contents include a description of the questionnaire; response to the survey in terms of analysis and testing tasks and program requirements; and the degree of correlation between analysis results, testing data and field performance. GRA

N84-14709# Naval Postgraduate School, Monterey, Calif.
GENERAL PURPOSE ELECTRONIC TEST EQUIPMENT (GPETE)
ACQUISITION CONSIDERATIONS FOR AUTOMATED
CALIBRATION M.S. Thesis

W. D. STAHLER Jun. 1983 126 p
 (AD-A133865; NPS54-83-002) Avail: NTIS HCA07/MFA01
 CSCL 09B

Calibration is a vital logistics element that directly impacts operational readiness and mission capability. Declining manpower resources and fleet expansion necessitate improvements in calibration productivity. The Navy has initiated several calibration automation programs. Realization of the full potential of automated calibration systems requires that the test instrument be IEEE-488 general purpose interface bus (GPIB) configured. This thesis

examines the relative costs and benefits of configuring general purpose electronic test equipment (GPETE) with GPIB to facilitate automated calibration. It does so through the development of a simple cost-benefit analysis and a discussion of non-quantifiable advantages and disadvantages, based upon extensive interviews with experts and literature research. In general, the analysis supports GPIB procurement when procurement quantities are large, calibration procedures are lengthy, and/or the calibration interval is short. GRA

N84-14734# Olivetti (C.) and C., S.p.A., Turin (Italy).

AMIX: AN AUTOMATED SYSTEM FOR HANDLING ERROR NOTIFICATION DATA

G. BIAMONTI (ETNOTEAM, Milan), G. FACCIA, B. PEPINO, G. PICCIAU, and B. VALENT (ETNOTEAM, Milan) /in ESA Software Eng. p 31-35 Aug. 1983 refs

Avail: NTIS HC A13/MF A01

An automatic system for handling the notification of the errors found during the testing of a software product developed in an industrial environment is presented. It maintains an historical archive of all the problems met during the life cycle of the product, in order to be able to describe the quality trend. It is a component of the ATHENA quality control system and is written in C programming language, using UNIX/7 on a digital VAX/780.

Author (ESA)

N84-14743# LABEN Space Instrumentation and Systems, Milan (Italy).

THE ROLE OF QUALITY ASSURANCE IN THE DEVELOPMENT OF SOFTWARE FOR SPACE APPLICATIONS

S. RONCHI /in ESA Software Eng. p 115-124 Aug. 1983

Avail: NTIS HC A13/MF A01

Documentation used to guide software quality assurance during development and verification stages, and to give directives for the production of a set of engineering and configuration management documents is described. Requirement specifications, design, coding, testing, and acceptance of software products are discussed. Maintenance and auditing of space applications software are considered. Author (ESA)

N84-14760# European Space Agency, Paris (France).

ANSI ADA AND THE UK M-CHAPSE

J. G. P. BARNES /in ESA Software Eng. p 243-250 Aug. 1983 refs

Avail: NTIS HC A13/MF A01

The major changes to Ada resulting from the ANSI standardization process are summarized. The M-CHAPSE project to provide the foundation for a professional programming support environment for Ada and CHILL is described. The M-CHAPSE objectives are: to provide host-target development systems with source debugging on the host; to provide consistent and convenient user friendly interfaces; to provide an open ended environment which accommodates further tools; to provide a foundation which supports all aspects of the entire system life cycle; to provide a portable system which can be rehosted and retargeted at reasonable cost; and to provide a secure and reasonably efficient system. Author (ESA)

N84-17601# Council for Scientific and Industrial Research, Pretoria (South Africa).

QUALITY MANAGEMENT IN PROCUREMENT

T. D. ZEEDERBERG (Lyttleton Engineering Works (Pty) Ltd.) /in /its Mini-Seminar on Quality Assurance 4 p Nov. 1982

Avail: NTIS HC A04/MF A01

Quality control and procurement in financial management are discussed. Some required skills are outlined: manufacturing technology, backed up by process design and manufacturing planning; procurement capability; product support; and economically viable methods to satisfy the needs. E.A.K.

09 RELIABILITY AND QUALITY CONTROL

N84-17602# South African Bureau of Standards, Pretoria. Mechanical Engineering Dept.

MANAGEMENT INPUT IN QUALITY

In CSIR Mini-Seminar on Quality Assurance 11 p Nov. 1983 refs

Avail: NTIS HC A04/MF A01

Quality assurance, its importance and meaning to management are outlined. It is suggested that motivation of management to accept quality assurance programs and to understand them is to accept that these systems do also start with management.

E.A.K.

N84-17603# Council for Scientific and Industrial Research, Pretoria (South Africa).

DESIGN QA ON A SMALL BATCH PROJECT

H. W. GRIFFITHS (TUV-Rheinland (SA) (Pty) Ltd.) *In its Mini-Seminar on Quality Assurance* 5 p Nov. 1982

Avail: NTIS HC A04/MF A01

Quality assurance design stages of a one off project are described. The tasks of the project manager are outlined. The need for quality assurance during design and development stages is emphasized.

E.A.K.

N84-17605# GEC Machines Proprietary Ltd. Foundry (England).

MEASURING QUALITY ACHIEVEMENTS

D. A. HYND *In CSIR Mini-Seminar on Quality Assurance* 16 p Nov. 1982 refs

Avail: NTIS HC A04/MF A01

The effectiveness of a quality within an organization must be capable to be measured in a consistent manner, to provide evidence of improvement is outlined. Areas of weakness in the organization which will benefit most from the application of corrective measures are indicated. Quality costing and product quality are two techniques which may provide the necessary data to indicate to management the progress. The basis for future quality planning strategy are outlined.

E.A.K.

N84-21128# Boeing Aerospace Co., Seattle, Wash.

SOFTWARE QUALITY MEASUREMENT FOR DISTRIBUTED SYSTEMS, VOLUME 1 Final Technical Report, Oct. 1980 - Mar. 1983

T. P. BOWEN, J. V. POST, J. TSAI, P. E. PRESSON, and R. L. SCHMIDT Griffiss AFB, N.Y. RADC Jul. 1983 131 p 3 Vol.

(Contract F30602-80-C-0330; AF PROJ. 5581)

(AD-A137955; RADC-TR-83-175-VOL-1) Avail: NTIS HC A07/MF A01 CSCL 09B

Software metrics (or measurements) which are used to indicate and predict levels of software quality were extended from previous research to include considerations for distributed computing systems. Aspects of the products of software life-cycle activities which could affect the quality levels of software, and metrics to measure them, were identified. Two new quality factors, survivability and expandability, were validated. A Guidebook for Software Quality Measurement was produced to aid in setting quality goals, applying metric measurements, and making quality level assessments. New metrics for interoperability and reusability were also included in the guidebook. The objective of this contract was to conduct exploratory development of techniques to measure system quality with a perspective on both software and hardware from a life cycle viewpoint. The effort was expected to develop and validate metrics for software quality on networked computers and distributed systems; i.e., systems whose functions may be tightly distributed over microprocessors or specialized devices such as data base machines. At the same time, the effects hardware has on software was to be studied, as well as the trade-offs between hardware, firmware, and software. The results of this research are reported in this volume.

GRA

N84-21129# Boeing Aerospace Co., Seattle, Wash.

SOFTWARE QUALITY MEASUREMENT FOR DISTRIBUTED SYSTEMS. VOLUME 2: GUIDEBOOK FOR SOFTWARE QUALITY MEASUREMENT Final Technical Report, Oct. 1980 - Mar. 1983

T. P. BOWEN, J. V. POST, J. TSAI, P. E. PRESSON, and R. L. SCHMIDT Griffiss AFB, N.Y. RADC Jul. 1983 274 p 3 Vol.

(Contract F30602-80-C-0330; AF PROJ. 5581)

(AD-A137956; RADC-TR-83-175-VOL-2) Avail: NTIS HC A12/MF A01 CSCL 09B

Software metrics (or measurements) which are used to indicate and predict levels of software quality were extended from previous research to include considerations for distributed computing systems. Aspects of the products of software life-cycle activities which could affect the quality levels of software, and metrics to measure them, were identified. Two new quality factors, survivability and expendability, were validated. A Guidebook for Software Quality Measurement was produced to aid in setting quality goals, applying metric measurements, and making quality level assessments. New metrics for interoperability and reusability were also included in the guidebook. This volume describes the application of quality metrics to distributed systems and provides guidance for AF acquisition managers. The guidebook provides guidance for specifying and measuring the desired level of quality in a software product.

GRA

N84-21130# Boeing Aerospace Co., Seattle, Wash.

SOFTWARE QUALITY MEASUREMENT FOR DISTRIBUTED SYSTEMS. VOLUME 3: DISTRIBUTED COMPUTING SYSTEMS. IMPACT ON SOFTWARE QUALITY Final Technical Report, Oct. 1980 - Mar. 1983

T. P. BOWEN, J. V. POST, J. TSAI, P. E. PRESSON, and R. L. SCHMIDT Griffiss AFB, N.Y. RADC Jul. 1983 221 p 3 Vol.

(Contract F30602-80-C-0330; AF PROJ. 5581)

(AD-A137957; RADC-TR-83-175-VOL-3) Avail: NTIS HC A10/MF A01 CSCL 09B

Software metrics (or measurements) which are used to indicate and predict levels of software quality were extended from previous research to include considerations for distributed computing systems. Aspects of the products of software life-cycle activities which could affect the quality levels of software, and metrics to measure them, were identified. Two new quality factors, survivability and expendability, were validated. A Guidebook for Software Quality Measurement was produced to aid in setting quality goals, applying metric measurements, and making quality level assessments. New metrics for interoperability and reusability were also included in the guidebook. This volume describes a qualitative study of distributed system characteristics, reasons for selection, design strategies, topologies, scenarios, and trade-offs. These analyses led to the changes in the Framework shown in Volume 1, and to the validation of models.

GRA

N84-21404*# National Aeronautics and Space Administration, Washington, D. C.

NASA'S EMERGING PRODUCTIVITY PROGRAM

D. R. BRAUNSTEIN *In its NASA Admin. Data Base Management Systems*, 1983 p 1-8 Apr. 1984

Avail: NTIS HC A08/MF A01 CSCL 05B

The goals, membership, and organizational structure of the NASA Productivity Steering Committee are described as well as steps taken to make NASA a leader in the development and application of productivity and quality concepts at every level of agency management. The overall strategy for the Productivity Improvement and Quality Enhancement (PIQE) Program is through employee involvement, both civil servant and contractor, in all phases of agency-wide activity. Elements of the PIQE program and initial thrusts are examined.

A.R.H.

N84-21414*# National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.

SPECIFICATIONS FOR A FEDERAL INFORMATION PROCESSING STANDARD DATA DICTIONARY SYSTEM

A. GOLDFINE /In NASA, Washington NASA Admin. Data Base Management Systems, 1983 p 121-144 Apr. 1984 refs
 Avail: NTIS HC A08/MF A01 CSCL 05B

The development of a software specification that Federal agencies may use in evaluating and selecting data dictionary systems (DDS) is discussed. To supply the flexibility needed by widely different applications and environments in the Federal Government, the Federal Information Processing Standard (FIPS) specifies a core DDS together with an optimal set of modules. The focus and status of the development project are described. Functional specifications for the FIPS DDS are examined for the dictionary, the dictionary schema, and the dictionary processing system. The DDS user interfaces and DDS software interfaces are discussed as well as dictionary administration. A.R.H.

N84-22259# Ohio State Univ., Columbus.

ANALYZING PROGRAM METHODOLOGIES USING SOFTWARE SCIENCE Final Report, 1 Aug. 1980 - 31 Dec. 1983

W. H. ZWEBEN Jan. 1984 12 p
 (Contract DAAG29-80-K-0061)
 (AD-A138121; ARO-17150.4-EL) Avail: NTIS HC A02/MF A01 CSCL 09B

The ultimate goal of the research program is to enhance the quality of computer software. In order to accomplish this goal, however, there have to be agreed upon notions of just what quality means and how it can be assessed. This project sought to make contribution to our understanding of these issues. One of the specific objectives of this project was to study software science metrics in the COBOL arena, another objective concerned the evaluation of principles of software development. Research also sought to examine instruments alternative to the comprehension test which are easier to create but which are still reliable and valid means of measuring one's understanding of a piece of software. Author (GRA)

N84-23011# National Academy of Sciences - National Research Council, Washington, D. C. National Materials Advisory Board.

PRIORITIES FOR DETAILED QUALITY ASSESSMENTS OF THE NATIONAL DEFENSE STOCKPILE NONFUEL MATERIALS

1984 66 p refs
 (NMAB-403) Avail: NTIS HC A04/MF A01

Forty four nonfuel materials, or groups of related materials, were examined for quality assessment. It was found that 18 were usable by today's industry and 12 need no immediate quality assessment. Eight materials need immediate quality assessment because of their critical role in national defense. Summary data on storage conditions and specifications are presented for these materials. Detailed analyses of the entire stockpile should be considered for factors as likelihood of deterioration or contamination, technological changes in specifications, deficiency in analyses, quality data, end use tests or specifications, inability to expeditiously use the material in an emergency, and the cost. It is found that there is a need for detailed evaluation of many materials. E.A.K.

N84-23361# Air Force Logistics Command, Wright-Patterson AFB, Ohio.

QUALITY ASSURANCE - AIR FORCE LOGISTICS COMMAND Final Report

P. BROWN /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 409-410 1983

(AD-P002816) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper examines the scope of the Air Force Logistics Command's (AFLC) mission and focuses on current management indicators and initiatives related to Quality Assurance. The Quality Assurance discipline within AFLC is tasked with the responsibility of corporate oversight of the quality of workmanship of the commands' products, goods, and services. Since fiscal year 1976,

adverse trends have been noted in frequency of customer reported defects on these weapon systems, and several innovative and dramatic steps have been taken to reverse the decline in the technical competence of our work. In February 1981, the command established a Maintenance Industrial Quality Study Group that was chartered to examine the entire spectrum of quality, with special emphasis on five major categories. The five categories were: Policy Guidance; People Programs; Technology; Investment Benefits; and Management Systems. The ultimate goal of the study was to formulate a quality effort which placed maximum emphasis on defect prevention rather than defect correction. GRA

N84-23362# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

THE AVIONICS INTEGRITY PROGRAM (AVIP) Final Report

T. J. DICKMAN and L. F. CHESHIRE /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 411-415 1983

(AD-P002817) Avail: NTIS HC A24/MF A01 CSCL 15E

The Avionics Integrity Program (AVIP) is an Aeronautical Systems Division initiative to develop an orderly procedure to assure that we acquire reliable, high quality, and supportable avionics systems. A draft military standard has been prepared and has been distributed for review and comment. The draft standard outlines an orderly process using existing tools in order to assure integrity. The orderly technical process combined with an appropriate contract strategy using incentives is expected to yield the highest probability of success in achieving integrity. This paper introduces the Avionics Integrity Program (AVIP) and answers the questions often asked regarding the program. Author (GRA)

N84-23363# Defense Contract Administration Services, Cleveland, Ohio.

QUALITY AT THE CROSSROADS Final Report

C. R. HENRY and J. C. ALBINI /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 416-418 1983

(AD-P002818) Avail: NTIS HC A24/MF A01 CSCL 05A

In the coming years, American product quality will continue to be severely challenged in the world market place. We have lost much business and many jobs to foreign suppliers. Our nation's industry has suffered excessive loss of profits due to waste of materials and resources. Although foreign suppliers at one time held a substantial price advantage, this is no longer true in many instances. We are losing markets because of quality and reliability deficiencies. For the most part, American management has not fully grasped the impact of this quality challenge. They fail to recognize that effective quality control and assurance systems contribute significantly to profits, along with a product that conforms to specifications. Certain tasks are clearly defined for American industry and the military establishment; high quality performance is essential. This paper is concluded with what is needed if we are to regain our position of leadership in the world marketplace. Author (GRA)

N84-23364# Defense Logistics Agency, Alexandria, Va.

INCENTIVES FOR PRODUCT QUALITY NEED CONTRACT, COST, PRODUCTION AND FIELD CO-OPERATION Final Report

E. THEEDE /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 419-424 1983

(AD-P002819) Avail: NTIS HC A24/MF A01 CSCL 05A

The quality of a deliverable item be it hardware or software, is dependent upon the controls in place and the adherence to those controls. Military procurement generally requires an inspection system (MIL-I-45208a) and a quality system (MIL-Q-9858a) to assure product quality. Monetary incentives must be available to the individual complying with the controls that produce the characteristics. Material inspection via statistical means only provides a clue as to how many defective units may be in the lot. Statistical sampling is obviously advantageous to a contractor since the government accepts the probability of receiving a defective

09 RELIABILITY AND QUALITY CONTROL

product. All topics presented today are trying to help the government get the most for its money. The negative cost effects of material review boards, standard fixes (shop arrangements and field activities), statistical quality control, surplus parts procurement and contractor field service are usually figured in overhead and are not carefully examined and/or controlled. This paper will point out experiences in these areas and leave to your imagination how the heavy manhour involvement and costs associated with these areas could be minimized if quality incentives are provided at the point of manufacturing. Author (GRA)

N84-23365# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

A QUALITY IMPROVEMENT STRATEGY FOR SYSTEMS ACQUISITION Final Report

G. J. THIELEN *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 425-429 1983

(AD-P002820) Avail: NTIS HC A24/MF A01 CSCL 05A

Affordability and readiness are among the most prominent concerns in the defense establishment today--to say nothing about the Congress and the media. Any number of techniques, procedures and controls have been established to improve management of systems acquisition and to minimize cost growth, the perennial nemesis of large, complex human endeavors. Cost/schedule control systems and reporting, for example, are now standard practice. No one technique, or combination of techniques, has yet been found to provide a satisfactory solution for today's acquisition managers. It is our purpose to portray quality in systems acquisition from this commercially-oriented perspective. An improvement strategy which is relevant to both readiness and affordability is outlined. It treats quality in its broadest, multifunctional sense. The bottom line is that if quality/productivity improvement is important to us in defense, then we must manage to get it. The strategy to be discussed is not a one-shot program or a quick fix. Rather, it is a basic shift in how we approach our work and is based on application of successful commercial practice to the system acquisition environment. GRA

N84-23366# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

ENGINE PRODUCT PERFORMANCE AGREEMENTS AND THE FUTURE Final Report

J. VERTREES *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 430-434 1983

(AD-P002821) Avail: NTIS HC A24/MF A01 CSCL 05A

Engine Product Performance Agreements may take many forms. One of these is warranty. The Model Engine Warranty developed by Air Force, iteratively, over a three year period is one of the many variations. It is to be tailored to fit the situation and was designed to help engine program managers formulate a warranty if one is part of their strategy. One possible outcome of considering warranty is that a warranty is not needed. This paper explores aspects of the Model Engine Warranty and its improvements over earlier warranties. Future forms of engine product performance agreements are mentioned. The concept of future commonality or standardization is discussed, with some of its perceived benefits. Author (GRA)

N84-23401*# Arinc Research Corp., Annapolis, Md. **ASSESSMENT OF THE NASA FLIGHT ASSURANCE REVIEW PROGRAM**

J. HOLMES and G. PRUITT Aug. 1983 172 p refs (Contract NASW-3787)

(NASA-CR-173418; NAS 1.26:173418;

ARINC-RES-PUBL-3104-01-TR-3100) Avail: NTIS HC A08/MF A01 CSCL 05B

The NASA flight assurance review program to develop minimum standard guidelines for flight assurance reviews was assessed. Documents from NASA centers and NASA headquarters to determine current design review practices and procedures were evaluated. Six reviews were identified for the recommended

minimum. The practices and procedures used at the different centers to incorporate the most effective ones into the minimum standard review guidelines were analyzed and guidelines for procedures, personnel and responsibilities, review items/data checklist, and feedback and closeout were defined. The six recommended reviews and the minimum standards guidelines developed for flight assurance reviews are presented. Observations and conclusions for further improving the NASA review and quality assurance process are outlined. E.A.K.

N84-23813# North American Air Defense Command, Peterson AFB, Colo. System Control Div.

RELIABILITY IN SPACE: PROGRAM MANAGER AND USER AWARENESS

A. J. W. ANDERSON *In* AF Academy Proc. of the 1983 Symp. on Mil. Space Commun. and Operations p 33-35 1983 refs (AD-P002148) Avail: NTIS HC A07/MF A01 CSCL 05A

Space systems and satellite communications are now a reality. As these systems become more important to our military missions, we must ensure we have reliable equipment. The role of reliability is not just the responsibility of the project reliability engineer. The program manager and the user must understand the importance of the reliability program. The designers and users must have a mutual understanding of the program goals. If the engineer is the only one who can understand the system, the user will not agree it is what is needed and the program manager will not support the funding requirement. Author

N84-24244# Ultracom, Inc., Del Mar, Calif.

DEVELOPMENT OF A PROPOSED STANDARD FOR THE EXCHANGE OF SCIENTIFIC MICROCOMPUTER PROGRAMS Summary Report

J. M. FISCELLA Nov. 1983 16 p

(PB84-157940; ULT-2002) Avail: NTIS HC A02/MF A01 CSCL 09B

The incompatibility problems encountered between different microcomputer and supermicrocomputer systems for the exchange of software are reviewed. It examines the causes of exchange incompatibility for some of the most widely used hardware and operating systems, with the aim of specifying a set of exchange standards. More than one standards set is required because of the diversity of operating systems and mass storage formats. The exchange standard developed include specifications of what types of files are to be included on the mass storage exchange medium, as well as a full description of the mass storage format (including medium, density, operating system, etc.). Three different exchange standard sets are recommended, all utilizing diskettes. Author

N84-25074# Societe Nationale Industrielle Aerospatiale, Les Mureaux (France). Direction de la Qualite.

QUALITY CONTROL IN LARGE SYSTEMS DEVELOPMENT PHASE

H. EYCHENNE 1984 8 p Presented at ASQC Quality Congr. Trans., Denver, 1984

(SNIAS-832-422-102) Avail: NTIS HC A02/MF A01

The most important means used to assure, progressively during the whole development phase, that a large system will be able to satisfy the users are presented. In other words, the objective is to present the means of assuring the system's quality. First the problems to be solved are exposed, the major phases of a program from the initial requirements to the system utilization are recalled, some definitions for mutual understanding are explained and the different management specifications which have to be available when the development begins are mentioned as the management plans which must answer to this specifications. Author

N84-26035# European Space Agency. European Space Research and Technology Center, ESTEC, Noordwijk (Netherlands). Product Assurance Div.

PRODUCT ASSURANCE MANAGEMENT AND AUDIT SYSTEMS FOR ESA SPACECRAFT AND ASSOCIATED EQUIPMENT

May 1981 37 p

(ESA-PSS-01-10-ISSUE-1; ISSN-0379-4059) Avail: NTIS HC A03/MF A01

Product assurance (PA) requirements that are associated with, and complementary to, every other PA discipline are outlined. They cover program management, planning and auditing, the use of standard practices and configuration management. E.A.K.

N84-28763# Logistics Management Inst., Washington, D. C. **SYSTEM SAFETY IN AIRCRAFT ACQUISITION**

F. R. FROLA and C. O. MILLER Jan. 1984 119 p

(Contract MDA903-81-C-0166)

(AD-A141492; LMI-ML214) Avail: NTIS HC A06/MF A01 CSCL 05A

This report identifies management initiatives for strengthening the effectiveness of system safety in aircraft acquisition programs. More aggressive implementation of existing system safety policy can help reduce the mishap rate and the need for costly modification programs to correct safety deficiencies. Recommendations to OSD and the Military Departments include: (1) the need for continuing top management support; (2) staffing and funding for system safety efforts commensurate with responsibilities set forth in policy statements; (3) emphasis on the man-machine interface and the associated need for better coordination of system safety and human factors engineering activities; (4) improved methods for detecting system software hazards; (5) better utilization of advanced technology, including flight data recorders, ground proximity warning systems, and collision avoidance systems; (6) writing better contracts with respect to system safety tasks; and (7) more effective recruiting, training, and retention of system safety personnel. Author (GRA)

N84-29026# Air Force Human Resources Lab., Brooks AFB, Tex.

SAFETY TRAINING PRIORITIES Final Report

N. A. THOMPSON and H. W. RUCK Apr. 1984 43 p

(Contract AF PROJ. 7719; AF PROJ. 2313)

(AD-A141711; AFHRL-TR-83-57) Avail: NTIS HC A03/MF A01 CSCL 05I

The Air Force is interested in identifying potentially hazardous tasks and prevention of accidents. This effort proposes four methods for determining safety training priorities for job tasks in three enlisted specialties. These methods can be used to design training aimed at avoiding loss of people, time, materials, and money associated with on-the-job accidents. Job tasks performed by airmen were measured using task and job factor ratings. Combining accident reports and job inventories, subject-matter experts identified tasks associated with accidents over a 3-year period. Applying correlational, multiple regression, and cost-benefit analysis, four methods were developed for ordering hazardous tasks to determine safety training priorities. GRA

N84-30778# Sandia Labs., Albuquerque, N. Mex.

QUALITY ASSURANCE (QA) PROCEDURES FOR COMPUTER SOFTWARE IN DEPARTMENT 1510

M. E. FEWELL, D. K. GARTLING, C. M. KORBIN, A. J. RUSSO, and C. E. SISSON Feb. 1984 27 p refs

(Contract DE-AC04-76DP-00789)

(DE84-012131; SAND-84-0311) Avail: NTIS HC A03/MF A01

The Quality Assurance (QA) plan for Department 1510 is described and all standards, requirements and participant responsibilities for its implementation are provided. DOE

N84-31166# Martin Marietta Aerospace, Orlando, Fla.

STANDARDS AND INTEGRATED AVIONIC DIGITAL SYSTEM ARCHITECTURE

E. L. GRIFFIN In ASD Proc. Papers of the 2nd AFSC Avionics Std. Conf., Vol. 2 p 563-581 Nov. 1982 Proc. held in Dayton, Ohio, 30 Nov. - 2 Dec. 1982

(AD-P003561) Avail: NTIS HC A25/MF A01 CSCL 09B

Integrated digital system design and development of the hardware, software, and interfaces that integrate the avionic flight control, fire control, and man-machine display and control must emphasize the man-rated weapon system's availability and survivability. The scope of tasks including detailed trade studies such as CMOS/SOS versus ECL semiconductor use, and parallel pipelining versus multi-microprocessor architecture usually requires an engineering team with backgrounds from requirements and integration, electronics hardware, packaging, and software. System attributes of fault tolerance, fail safe, and fail soft operation requires total team adherence to a set of design, documentation, implementation, and test standards of which few have complete familiarity. Since use of these standards has prevented costly errors and overruns in procurement, and decreased maintenance costs over the life cycle, this paper shows how to make each effective contributor on the team understand the standards controlling performance and product specifications, change and configuration control, test planning, and test procedure generation for the other areas of expertise. Author (GRA)

N84-31175# IBM Federal Systems Div., Bethesda, Md.

DEFENSE INDUSTRY ATTITUDES ABOUT AF INTERFACE STANDARDS REPORT OF AN ELECTRONICS INDUSTRIES ASSOCIATION SURVEY

P. N. POCALYKO and C. E. SWALLOW, JR. In ASD Proc. Papers of the 2nd AFSC Avionics Std. Conf., Vol. 2 p 721-727 Nov. 1982 Proc. held in Dayton, Ohio, 30 Nov. - 2 Dec. 1982

(AD-P003570) Avail: NTIS HC A25/MF A01 CSCL 09C

Major General Welch USAF, Asst. Deputy Chief of Staff for Research, Development and Acquisition, has asked the Electronic Industries Association for policy level participation in the Air Force's avionics standards program. This paper reports on the initial step of the response of industry. It analyzes a survey made under the sponsorship of the EIA. Defense industry managers and senior engineers experienced in the development and production of mission-critical avionics and software were questioned about their experiences and opinions concerning the Air Force standards for J-73 (JOVIAL), Ada, 1553 Data Bus, and 1750 Instruction Set Architecture. The responses are cross-correlated with experience levels and nature of the respondent's field of expertise. Results are presented as a summary of current attitudes which can serve as data base for focusing issues for further discussion with industry. Author (GRA)

N84-31192# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

MATE STANDARDIZATION

R. E. FARMER In its Proc. Papers of the 2nd AFSC Avionics Std. Conf., Vol. 2 p 1005-1012 Nov. 1982 Proc. held in Dayton, Ohio, 30 Nov. - 2 Dec. 1982

(AD-P003587) Avail: NTIS HC A25/MF A01 CSCL 14B

The MATE (Modular Automatic Test Equipment) program was developed to combat the proliferation of unique, expensive ATE within the Air Force. MATE incorporates a standard management approach and a standard architecture designed to implement a cradle-to-grave approach to the acquisition of ATE and to significantly reduce the life cycle cost of weapons systems support. These standards are detailed in the MATE Guides. The MATE Guides assist both the Air Force and Industry in implementing the MATE concept, and provide the necessary tools and guidance required for successful acquisition of ATE. The guides also provide the necessary specifications for industry to build MATE-qualifiable equipment. The MATE architecture provides standards for all key interfaces of an ATE system. The MATE approach to the acquisition and management of ATE has been jointly endorsed by the commanders of Air Force Systems Command and Air Force

09 RELIABILITY AND QUALITY CONTROL

Logistics Command as the way of doing business in the future.
Author (GRA)

A84-32705*# ARCO Solar, Inc., Woodland Hills, Calif. QUALIFICATION TESTING AND ELECTRICAL MEASUREMENT EXPERIENCE: A MANUFACTURER'S VIEW

J. C. ARNETT, J. E. COOLEY, and T. L. WINGERT *In* JPL
Proc. of the Flat-Plate Solar Array Proj. Res. Forum on the Design
of Flat-Plate Photovoltaic Arrays for Central Sta. p 277-281
1983

Avail: NTIS HC A14/MF A01 CSCL 09C

ARCO Solar's experiences as a participant in an industry-utility-government environmental qualification team examining photovoltaic devices are discussed. Included is an assessment of the applicability, completeness and appropriateness of the testing procedures and of the acceptance criteria for megawatt-sized procurements for utilities. Like the stand-alone users, the utility industry is interested in obtaining low costs, but additional concerns exist related to reliability and durability, safety, grounding and overall system criteria including performance prediction (related to output power acceptance testing), power quality and dispatchability. For purposes of this first major purchase of photovoltaic modules and panels by the utility industry, there was a carry-over of the JPL specifications. The need exists for further development, assessment, and selection of qualification and testing standards and evaluation criteria specifically addressing these additional concerns for utility-connected PV power-plant applications.
R.J.F.

10

LEGALITY, LEGISLATION, AND POLICY

Includes Laws and Legality, Insurance and Liability, Patents and Licensing, Legislation and Government, Regulation, Appropriations and Federal Budgets, Local, National, and International Policy.

A84-11311

PRODUCT LIABILITY IN AVIATION AND ITS INSURABILITY [PRODUKTHAFTPFLICHT IM LUFTVERKEHR UND IHRE VERSICHERBARKEIT]

W. D. MUELLER-ROSTIN *Zeitschrift fuer Luft- und Weltraumrecht*
(ISSN 0340-8329), vol. 32, Sept. 1983, p. 225-241. *In* German.
refs

The provisions of FRG, European Parliament, Common Market, and U.S. law and jurisdiction regarding the liability of the manufacturers and sellers of aviation equipment are reviewed, with an emphasis on the recent increase in the amount of liability litigation. Consideration is given to such topics as contractually fixed warranties, negligence, strict liability in tort, the definition of 'manufacturer', and the different classifications of defects (fabrication defects, series defects, instruction defects, and quality-control outliers). It is shown that manufacturers, both of the finished aircraft and of its components, can be held liable for damages in many cases under all three legal systems; hence an umbrella insurance plan covering all participants in the construction of the aircraft is recommended. Policy provisions defining the insured parties, the losses insured, the contract duration, and the basis for calculating premiums are proposed.
T.K.

A84-14048

AVIATION - THE NEED FOR UNIFORM LEGISLATION

J. J. KENNELLY *Journal of Air Law and Commerce* (ISSN 0021-8642), vol. 48, Spring 1983, p. 613-646. refs

The problems arising from the nonuniformity of state legislation governing the rights of claimants and defendants after aircraft accidents are reviewed, and possible solutions are considered. The differences in applicable laws and in the choice-of-law provisions of the states are illustrated and the current situation is shown to be patently inconsistent. Federal bills proposed to correct

this situation, including HR 1027 and the Air Travel Protection Act are found to be deficient in correcting the problems or overly protective of carriers and aircraft manufacturers, to the detriment of passengers. Precedents are also cited to show that federal legislation will not be sufficient to create 'uniform' treatment of claims. The basic provisions of a uniform state statute to be initiated by the National Commissioners on Uniform State Laws are outlined.
D.G.

A84-16892

SPACE INSURANCE - ISSUES AND PROBLEMS

B. STOCKWELL (Corroon and Black Inspace, Inc., Washington, DC) *Space Communication and Broadcasting* (ISSN 0167-9368), vol. 1, Oct. 1983, p. 261-267.

It is pointed out that over the last several years more and more space system owners have sought insurance coverage for their operations. The types of insurance coverage available are examined, taking into account political risk coverage, investment protection coverage, prelaunch coverage, aerospace liability coverage, launch and commissioning coverage, in-orbit/failure coverage, service interruption coverage, transponder coverage, and revenue stream protection. Attention is given to aspects of risk management, launch and commissioning rates, and special problems. Special problems considered are related to multiple payload interactions, abort possibilities and abort modes of the Shuttle, the time sensitivity of Shuttle operations, the short history of Ariane, and aspects of market fragility.
G.R.

A84-17055#

THE LAW APPLICABLE TO CONTRACTS ON SPACE ACTIVITIES

K.-H. BOECKSTIEGEL (Koeln, Universitaet, Cologne, West Germany) *IN: Colloquium on the Law of Outer Space, 25th, Paris, France, September 27-October 2, 1982, Proceedings*. New York, American Institute of Aeronautics and Astronautics, 1983, p. 203-209. refs
(IAF PAPER 82-IISL-39)

The importance of contracts has to do with the growing number of participants, governmental and nongovernmental, in space activities. It is noted that whenever the parties include in their contractual instrument an express clause designating a particular body of law as the proper law of their contract, that designation is today recognized as valid. If the parties do not expressly or by contractual indication choose a particular substantive law, the applicable substantive law will normally have to be found by the methods developed in traditional private international law. The applicability of mandatory and public law is discussed, along with that of public international law.
C.R.

A84-20150

GOVERNMENT LIABILITY UNDER THE FEDERAL TORT CLAIMS ACT FOR NEGLIGENT INSPECTION AND CERTIFICATION OF AIRCRAFT

W. M. STEVENS *Air Law* (ISSN 0165-2079), vol. 8, no. 4, 1983, p. 230-237.

The question of FAA liability under the Federal Tort Claims Act (FTCA) for damages resulting from negligent inspection or certification of aircraft is examined in a review of arguments in two cases awaiting appeal to the US Supreme Court. The Ninth Circuit Court of Appeals has ruled in both *United Scottish Insurance Co. vs. US and Varig vs. US* that Good Samaritan liability provisions of state law apply to the FAA inspection and certification program. The state law is cited and interpreted, the FAA's responsibilities (as defined in the Federal Aviation Act) are outlined, and precedents involving the applicability of the FTCA are surveyed. It is concluded that the Court of Appeals decision, if upheld, will expose the FAA to liability claims in almost every crash case; hence great care in performing and documenting inspections will be required.
T.K.

A84-20454

THE LIABILITY OF THE UNITED STATES FOR NEGLIGENT INSPECTION 1983

C. F. KRAUSE (Speiser, Krause and Modole, New York, NY) and J. T. COOK (Speiser, Krause and Modole, Los Angeles, CA) *Journal of Air Law and Commerce* (ISSN 0021-8642), vol. 48, Summer 1983, p. 725-751. refs

The current status of litigation involving US government liability for negligent inspection of aircraft by the FAA is reviewed. Such liability is based on the exemption from sovereign immunity granted by the Federal Tort Claims Act (FTCA), but specific criteria must be applied because there are numerous exceptions allowed under that act. The regulations governing the FAA certification and inspection of aircraft are explained, and the recent court decisions involving the applicability of the FTCA are surveyed. The two appellate decisions in *United Scottish Insurance Company vs US* and the decision consolidating *Varig Airlines vs US* and *Mascher vs US* are analyzed in detail, considering the absence-of-duty, misrepresentation, and discretionary-function defenses proposed by the US side. In essence, the US is liable when an FAA employee fails negligently, in an actual physical inspection, to detect a defect which is covered by an objectively measurable publicly known regulation and which can be shown to have caused the injury to the plaintiff. T.K.

A84-20456

THE GROWTH OF AMERICAN JUDICIAL HOSTILITY TOWARDS THE LIABILITY LIMITATIONS OF THE WARSAW CONVENTION

R. B. JEFFREY *Journal of Air Law and Commerce* (ISSN 0021-8642), vol. 48, Summer 1983, p. 805-834. refs

US court decisions with regard to the provisions of the Warsaw Convention are discussed in a critical review. The Convention articles and later additions and amendments are summarized, and the cases adjudicated are surveyed. Special attention is given to cases dealing with ticketing requirements and with the gold-franc conversion standard in the liability-limitation clause. It is argued that the courts, and especially the Supreme Court, must make greater use of statutory construction, constitutional review, and judicial constraint to resolve the existing uncertainties and inconsistencies, which are attributed to the unwillingness of the Senate and the executive to take any decisive action to affirm, revise, or abrogate the Convention. T.K.

A84-20646

THE LAUNCH AND PERFORMANCE OF SPACECRAFT - AN INSURANCE PERSPECTIVE

S. M. HILL (TRW, Inc., Space and Technology Group, Redondo Beach, CA) *Space Communication and Broadcasting* (ISSN 0167-9368), vol. 1, Dec. 1983, p. 393-403.

The importance of insurance to the commercialisation of space for telecommunications applications can hardly be exaggerated. This paper traces the evolution of the space insurance field as a whole and then proceeds to define the types of insurance coverage which can currently be obtained by the spacecraft supplier, the procurement authority, and the ultimate user, to protect against the various risks which exist at different stages of a program. Predictions are made on probable future developments in this dynamic field, developments which will be of fundamental importance for all parts of the private sector engaged in space activities. Author

A84-20675

IMPACT OF CURRENT U.S. POLICY ON INTERNATIONAL CIVIL AVIATION

A. A. MAJID *Zeitschrift fuer Luft- und Weltraumrecht* (ISSN 0340-8329), vol. 32, Dec. 1983, p. 295-325. refs

The newly introduced U.S. Air Transportation Policy has led to great changes in the field of civil aviation. The initiation of the process of change is related to the signing of the Airline Deregulation Act by President Carter on October 24, 1978. The effect of these developments on international civil aviation is discussed. A brief background picture is presented regarding the

civil aviation industry, and salient features of liberal agreements are examined. An analysis of the global effects of the U.S. liberalization policy is conducted, taking into account the impact on airlines, the impact on consumers, the impact on manufacturers of aviation products, the impact on civil aviation policies of other nations, and the impact on international institutions of civil aviation. G.R.

A84-24961

REGULATIONS AND THE AIR AMBULANCE

H. L. GIBBONS *Aviation, Space, and Environmental Medicine* (ISSN 0095-0562), vol. 55, March 1984, p. 239-243. refs

The recent biopolitical history of air ambulance development and the need for regulations is reviewed. There has been significant interaction between Aerospace Medical Association committees, the Federal Aviation Administration, and the Civil Aeronautics Board. The Federal Aviation Administration's Advanced Notice and Withdrawal of Proposed Rulemaking, the latter based on the FAA supposition that the 'majority' of states had enacted regulations and guidelines, is compared to actual data that only seven states have regulations and two have guidelines. The precedence for FAA to act on regulations is established. The Aerospace Medication Association and the National Highway Traffic Safety Administration - not the FAA have established and documented excellent guidelines. The FAA is providing a valuable service to aviation in general and air ambulance operations specifically through physiological training at military facilities which can provide information to promote patient protection in air ambulance operations. Author

A84-25032

AIRWORTHINESS DIRECTIVES - RECOVERING THE COST OF COMPLIANCE

D. WILSON (Grant, McHendrie, Haines, and Crouse, Denver, CO) *Journal of Air Law and Commerce* (ISSN 0021-8642), vol. 49, Fall 1983, p. 1-30. refs

The legal status of liability questions arising when FAA Airworthiness Directives (AD) mandate modifications to an aircraft is reviewed. Aircraft owners often attempt to recover from the manufacturer the costs of compliance to an AD, claiming either breach of warranty, negligence, strict product liability, or a private cause (implied) under the Federal Aviation Act of 1958. A survey of the case law in each of these areas reveals that owners have only very limited prospects of recovering compliance costs. A negotiated solution to this problem in the form of specific, strong AD-compliance warranties is considered more desirable than a legislative requirement that manufacturers bear all compliance costs. T.K.

A84-25033

AIR CARRIER LIABILITY UNDER DEREGULATION

C. DAVISON and D. H. SOLOMON (Crowell and Moring, Washington, DC) *Journal of Air Law and Commerce* (ISSN 0021-8642), vol. 49, Fall 1983, p. 31-70. refs

The effect of the Airline Deregulation Act of 1978 (effective January 1, 1983) on air-carrier liability for baggage loss or damage, overbooking, delayed or cancelled flights, lack of nonsmoking seats, and similar claims is discussed in a review of legislative, treaty, and administrative provisions and case law. The regulatory powers remaining to the CAB (at least until its planned 'sunset' in 1985) are defined, and the applicable articles of the Warsaw Convention and the common law are summarized. It is shown that carriers are exposed to greater liability in the areas which are no longer regulated and hence subject to stricter common-law standards. This liability can in general be limited by properly notifying passengers of the terms and conditions of carriage. T.K.

10 LEGALITY, LEGISLATION, AND POLICY

A84-27410

AIRCRAFT ACCIDENT INVESTIGATION PROCEDURES IN JAPAN

T. SAKAMOTO (Japan Air Lines Co., Ltd., Tokyo, Japan) (International Bar Association, Committee on Aeronautical Law, Annual Meeting, Toronto, Canada, Oct. 3-8, 1983) Air Law (ISSN 0165-2079), vol. 9, no. 1, 1984, p. 9-13.

The organization of aircraft-accident investigation in Japan is reviewed in the light of international requirements that the prevention of future accidents be the primary aim of such investigations. The overlapping interests, responsibilities, and powers of the government-appointed Aircraft Accident Investigation Board (AAIB), the military, the police and prosecutors, the airlines, and passengers are examined. The generally high level of cooperation among the parties involved is illustrated for the case of the DC-8-61 crash of February 9, 1982 (attributed to a psychological disturbance of the pilot). A potential problem is seen in the fact that AAIB or international-body reports can be used as evidence in criminal proceedings: constitutional protections against self-incrimination may conflict with the need for complete disclosure to prevent future accidents. T.K.

A84-27412

AIRCRAFT ACCIDENT ENQUIRIES - WHOSE INTEREST PREVAILS?

D. P. HERBERT (International Bar Association, Committee on Aeronautical Law, Annual Meeting, Toronto, Canada, Oct. 3-8, 1983) Air Law (ISSN 0165-2079), vol. 9, no. 1, 1984, p. 26-30.

Aircraft-accident investigation procedures in the UK are examined from the airline point of view. The main investigations by the Accidents Investigation Board (AIB) of the Transport Ministry, with the aim of establishing the causes of the accident and recommending action to prevent future accidents, are found to be thorough and professional, and their aims are fully endorsed. Concurrent coroner's inquests, fatal-accident inquiries, or criminal proceedings are often more emotional, receive greater press coverage, and may be less thorough than the AIB inquiry. Potential conflicts of interest arising from an accident (e.g., between an airline and the manufacturer, the maintenance facility, the ATC authority, the airport, or the rescue authority) are listed, and the priority of flight safety in resolving them is stressed. T.K.

A84-27416

NTSB PROCEDURES

P. A. GOLDMAN (National Transportation Safety Board, Washington, DC) (International Bar Association, Committee on Aeronautical Law, Annual Meeting, Toronto, Canada, Oct. 3-8, 1983) Air Law (ISSN 0165-2079), vol. 9, no. 1, 1984, p. 42-47.

The investigative procedures of the US National Transportation Safety Board (NTSB) are reviewed, with a focus on their relationship to litigation resulting from aircraft accidents. The current limitations imposed by NTSB rules on the ability of claimants and insurers to take part in hearings or gain access to evidence are defended as essential to the primary purpose of NTSB investigations, the prevention of future accidents. Documents and reports of the NTSB, with few exceptions, are subject to the Freedom of Information Act and can be obtained by the parties. This fact has caused some difficulties for the NTSB in cooperating with international investigations (as required by the ICAO) and may be a permanent, if not overly important point of difference preventing the adoption of uniform international procedures. T.K.

A84-29626

EFFECTS OF FAR 25.1309 ON AIRPLANE OPERATION AND MAINTENANCE

J. J. TREACY (FAA, Washington, DC) Society of Automotive Engineers, Aerospace Congress and Exposition, Long Beach, CA, Oct. 3-6, 1983, 8 p. (SAE PAPER 831405)

Common misconceptions about the numerical methods of analysis and the effects on aircraft maintenance and operations are examined. Topics covered include the meaning of 'failure condition', erroneously related to component failure; the verification

of the failure condition, incorrectly assumed to be based on a single component failure; and the reasons for periodic inspections, used to test a system operating infrequently or part of a multiple system. With regard to the maintenance tasks on the type certificate data sheet, a new procedure is proposed that will permit airline operators to change the initial certification maintenance requirements based on service experience without involving the manufacturer. Finally, attention is given to the reliability of tracking programs and the minimum equipment list authorized by FAR 121.627. C.M.

A84-29627

THE EFFECT OF REGULATION 25.1309 ON AIRCRAFT DESIGN AND MAINTENANCE

D. L. GILLES (Douglas Aircraft Co., Long Beach, CA) Society of Automotive Engineers, Aerospace Congress and Exposition, Long Beach, CA, Oct. 3-6, 1983, 10 p. (SAE PAPER 831406)

Positive and negative effects of FAR (Federal Air Regulation) 25.1309, and the philosophical background of the regulation are discussed. Consideration is given to the inconsistency between FAA interpretation and policy guidance, the subcontractor's noncomprehension of his role in certification, the shortage of qualified personnel, the self-test capability, and the more thorough evaluation of a system operation with faults during the certification process. Also covered are the more thorough maintenance considerations that occur during design, the embedment of fixed maintenance tasks in the type certificate, the excessive task tracking and reporting, and the airworthiness limitations imposed as a function of achieved operational reliability. C.M.

A84-29865

MAJOR CONCERNS OF PRIVATE ENTERPRISE REGARDING RECENT DEVELOPMENTS IN SPACE LAW

S. GOROVE (Mississippi University, University, MS) IN: Space manufacturing 1983; Proceedings of the Sixth Conference, Princeton, NJ, May 9-12, 1983. San Diego, CA, Univelt, Inc., 1983, p. 199-208. refs (AAS PAPER 83-221)

This presentation starts out by recalling one of the early concerns of private enterprise regarding the legitimacy of its activities in outer space. The discussion moves on to a consideration of some of the major concerns that have arisen in view of recent developments in space law. Among them are: (1) unresolved issues pertaining to the use of the geostationary orbit; (2) similar issues regarding the exploitation of the moon and other celestial bodies; (3) concerns about the international implications of direct television broadcasting by satellites; (4) misgivings about the adequacy of legal protection against damage, harm or interference which may occur in outer space; and, finally, (5) concerns about the state of governmental regulatory procedures. Author

A84-29868

A LEGAL CHARTER FOR NON-GOVERNMENTAL SPACE INDUSTRIALIZATION

M. A. ROTHBLATT (Schnader, Harrison, Segal and Lewis, Washington, DC) IN: Space manufacturing 1983; Proceedings of the Sixth Conference, Princeton, NJ, May 9-12, 1983. San Diego, CA, Univelt, Inc., 1983, p. 229-247. refs (AAS PAPER 83-225)

Maximum and minimum legal bounds for the exercise of state supervision and authorization of nongovernmental activity in outer space are specified. Legal limits are given in both international and United States law. It is shown that both existing United States law and current regulation theory mandate a minimum exercise of state supervision and authorization for a defined class of space industrialization activities and that they specify supervisory and control responsibilities. This class of activity, together with the supervisory and control responsibilities, is outlined. Statutory language is suggested pursuant to which firms will receive legal charters to engage in a broad class of space development activity. On the basis of existing space law treaties and other fundamental

principles of international law, it is shown that state exercise of supervision and authorization may range from state operation of all space activity to state responsibility for all space activity.

C.R.

A84-29870 EMERGING GOVERNMENT REGULATION OF AMERICAN SPACE ENTREPRENEURS

J. R. MYERS (Andrews and Kurth, Washington, DC) IN: Space manufacturing 1983; Proceedings of the Sixth Conference, Princeton, NJ, May 9-12, 1983. San Diego, CA, Univelt, Inc., 1983, p. 259-272.

(AAS PAPER 83-227)

The emergence of American space entrepreneurs, who have questioned some of the most fundamental operating assumptions of both the Federal Government and large aerospace government contractors, is accompanied by the need for supervision of these private sector activities to protect governmental interests and satisfy international obligations. The role of the FAA, the State Department, and the FCC in governing private entities doing business in outer space is discussed. It is noted that the Senior Interagency Group for Space, as established through the Presidential Space Policy issued on July 4, 1982, is considering a policy statement regarding ownership and operation by private entities of the Space Shuttle and expendable launch vehicles. The roles of other agencies and institutions with influence over the approvals process for launch operations, space stations, positioning systems, etc., such as the U.S. Congress, NASA, and the Department of Defense, are also considered.

J.N.

A84-36942 DEREGULATION AND COMMUTER AIRLINE SAFETY

C. V. OSTER, JR. and C. K. ZORN (Indiana University, Bloomington, IN) Journal of Air Law and Commerce (ISSN 0021-8642), vol. 49, no. 2, 1984, p. 315-335. refs

The effect of the 1978 Airline Deregulation Act on the level of safety in the commuter airline industry is examined. Through a comparison of the safety records of different segments of the commuter industry with that of the major jet carriers, the question of whether the growing role of commuter airlines is inconsistent with the goal of maintaining air safety is analyzed. As part of the analysis, the safety performance of the commuter industry between 1970 and 1980 is examined with a focus on systematic differences among major subsets of the industry. It is concluded that, in general, the safety record of domestic commuter airlines has not been affected by deregulation, and that it is virtually identical to the superior safety record of the larger jet carriers. Moreover, the introduction of the next generation of turbine-powered commuter aircraft should contribute to improved commuter safety due to the small carriers' ability to operate turbine-powered aircraft much more safely than piston aircraft.

I.H.

A84-38475# LEGAL STATUS OF MEMORANDA OF UNDERSTANDING IN THE UNITED STATES

W. M. THIEBAUT (ESA, Legal Affairs Dept., Paris, France) ESA Bulletin (ISSN 0376-4265), no. 38, May 1984, p. 99-104.

NASA and ESA have a long-standing and successful history of cooperation in space, mainly in the area of space science. The modalities of such cooperation are laid down in legal instruments which, in the majority of cases, take the form of Memoranda of Understanding (MOUs). There is no doubt that under international law such MOUs constitute international agreements which are binding upon the parties. However, questions can be raised regarding the order of precedence under national law between international agreements and, in this case, U.S. domestic legislation.

Author

A84-42618

PATENT GUIDELINES FOR RESEARCH MANAGERS

J. R. BELL (Sperry Corp., Computer Systems Div., Blue Bell, PA) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Aug. 1984, p. 102-104.

Basic considerations of corporate patent policy are discussed, with emphasis on the complex questions addressed by attorneys engaged in patent law practice. Attention is given to corporation employee inventions, the ascertainment of true inventorship, the reduction of an invention to practice, the importance of record-keeping in patenting procedures, relationships between company inventors and law departments, invention reviews by technical committees, and the issues of infringement, interference, and licensing that may arise after the granting of a patent.

O.C.

A84-43365

FEDERAL GOVERNMENT REGULATION OF COMMERCIAL OPERATIONS USING EXPENDABLE LAUNCH VEHICLES

J. R. MYERS (Andrews and Korth, Washington, DC) Journal of Space Law, vol. 12, Spring 1984, p. 40-51. refs

Policies and regulations enacted or under discussion by the U.S. government to stimulate and regulate privately owned expendable launch services are described. Supervisory authority is vested in the FAA, the State Department, and the FCC. Input is also received from Congress, NASA, the DOD, the National Security Council, the DOC, OMB, etc. Bills are under consideration to be both regulate and promote private space ventures. NASA is asserted to have claimed no jurisdiction, responsibility, or interest in private ventures but will inevitably furnish, sell, advise on, or supervise the use of much of the technology that will be used for private launches. Areas of interest for other governmental branches are discussed.

M.S.K.

A84-44852

LEGAL ASPECTS OF COMMERCIAL SPACE ACTIVITIES

M. MENTER (International Institute of Space Law, Paris, France) CIDA, vol. 7, 1982, p. 17-50.

As a result of past space-related developments, the private sector is already participating in commercial activities in space communications. Future space endeavors will provide increasing opportunities for extensive private sector participation. The present investigation is concerned with the legal aspects of such a participation. The government role in space activities is examined, taking into account questions regarding authorization and supervision, planning by Department of Commerce actions and on the basis of NASA requirements, problems of liability, and questions of jurisdiction. The status of private sector space activities is also discussed, giving attention to a compliance with U.S. Treaty obligations, the personnel of a commercial concern who are aboard an object in outer space, FAA responsibilities over private sector space flight, the exploitation of resources of celestial bodies, and aspects of government-industry cooperation.

G.R.

A84-44854

THE WARSAW CONVENTION - A DISCUSSION OF THE PRESENT POSITION

A. KEAN (International Civil Aviation Organization, Montreal, Canada) CIDA, vol. 7, 1982, p. 61-67.

The Warsaw Convention was adopted in 1929. The present investigation is concerned with the objectives of this convention and its position in 1982. The Warsaw Convention involved a deal by which protection was given to infant airlines in the form of limitation of liability in exchange for the passenger, or his dependents, or the shipper of cargo, being given the benefit of the reversal of the burden of proof of negligence. A second purpose of the Convention was related to the desire to achieve some international uniformity. A study is conducted regarding the need for a protection of airlines by limited liability, taking into account current conditions in the U.S., the developing countries, the Soviet block countries, and the other countries. Attention is given to the incentive provided by the percentage free system, the Hague Protocol of 1955, the Montreal Agreement, developments in Europe, and the Guatemala City Protocol.

G.R.

10 LEGALITY, LEGISLATION, AND POLICY

N84-11069# Committee on Commerce, Science, and Transportation (U. S. Senate).

POLICY AND LEGAL ISSUES INVOLVED IN THE COMMERCIALIZATION OF SPACE

M. S. SMITH and D. H. ZAFREN Washington GPO 1983 57 p refs Presented to the Comm. on Com., Sci. and Transportation, 98th Congr., 1st Sess., 23 Sep. 1983 Prepared by the Library of Congr., Congr. Res. Serv.

(GPO-21-495) Avail: Committee on Commerce, Science and Transportation

Since space commercialization is primarily a private sector responsibility, some government responsibility must be relinquished so that there can be optimal public benefit. The proper role of government in space commercialization; regulatory issues; international legal responsibility and liability; present domestic regulatory schemes; private industry perceptions; legislative proposals; and future legal problems are considered. A.R.H.

N84-11979# National Academy of Engineering, Washington, D. C. Ad Hoc Committee on Government-University Relationships in Support of Science.

STRENGTHENING THE GOVERNMENT-UNIVERSITY PARTNERSHIP IN SCIENCE

Apr. 1983 256 p Sponsored in part by the Lounsbery Foundation, the White House Office of Science and Technology Policy, the Alfred P. Sloan Foundation, the Rockefeller Foundation and the William and Flora Hewlett Foundation (PB83-230870; ISBN-0-309-03380-2; LC-83-61258) Avail: NTIS HC A12/MF A01 CSCL 05A

The history of the government-university partnership and its dramatic evolution in the post-World War II period is outlined. Areas of tension are discussed. These areas include graduate education science and engineering, accountability, cost sharing and indirect costs, university research capacity, and industry-university relations as affected by government. A new and independent body, the Government-University Forum is proposed to improve communication between the partners and facilitate solutions to problems they share and will share in the future.

GRA

N84-13017* National Aeronautics and Space Administration, Washington, D. C.

NASA PATENT ABSTRACTS BIBLIOGRAPHY. SECTION 1: ABSTRACTS. A CONTINUING BIBLIOGRAPHY

Jul. 1983 56 p

(NASA-SP-7039(23)-SECT-1; NAS 1.21:7039(23)-SECT-1) Avail: NTIS HC A04 CSCL 05B

Abstracts are cited for 129 patents and patent applications introduced into the NASA scientific and technical information system during the period January 1983 through June 1983. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or patent application. S.L.

N84-13018* National Aeronautics and Space Administration, Washington, D. C.

NASA PATENT ABSTRACTS BIBLIOGRAPHY. SECTION 2: INDEXES. A CONTINUING BIBLIOGRAPHY (SUPPLEMENT 23)

Jul. 1983 373 p

(NASA-SP-7039(23)-SECT-2; NAS 1.21:7039(23)) Avail: NTIS HC A16 CSCL 05B

Entries for 4000 patent and patent applications citations for the period May 1969 through June 1983 are listed. Subject, invention, source, number, and accession number indexes are included. S.L.

N84-14070# Civil Aeronautics Board, Washington, D.C.

DEREGULATING THE AIRLINES: AN ECONOMIC ANALYSIS

E. E. BAILEY, D. R. GRAHAM, and D. P. KAPLAN May 1983 450 p refs

(PB83-250019) Avail: NTIS HC A19/MF A01 CSCL 05C

The history of government regulation of the airline industry is reviewed and the deregulation process is described. The economic performance of the deregulated industry is analyzed from an

economic point of view. Deregulation brought substantial changes to the formerly regulated carrier's route networks and pricing policies. It also allowed new carriers, often with lower costs and different types of service, to provide scheduled interstate service. These changes are analyzed and the impact of deregulation on the convenience of air service, most notably to small communities is considered. Whether deregulated airline markets are operating competitively is examined. GRA

N84-14985# Patent and Trademark Office, Washington, D. C. Office of Technology Assessment and Forecast

DESIGN PATENTS

Oct. 1983 261 p

(PB83-224063) Avail: NTIS HC \$15.50/MF A01 CSCL 05B

In a continuing effort to provide useful information about every aspect of the U.S. patent file, the Office of Technology Assessment and Forecast (OTAF) has gathered all available statistics about U.S. design patents granted between 1842 and 1982. In addition to a brief explanation of design patents, this publication analyzes trends and identifies the origins and ownership of design patents. OTAF has examined in detail design patents granted between 1977 and 1982, identified design areas of highest activity, and profiled major divisions within the design patent file. The first section of the report discusses the history of design patenting in the United States, describes the contents of a design patent, and shows the major divisions of subject matter within the Design Patent Classification System. Author (GRA)

N84-18095# Computer Horizons, Inc., Cherry Hill, N. J.

FURTHER DELINEATION OF THE UTILIZATION OF SCIENTIFIC LITERATURE BY U.S. PATENTS Final Report

M. P. CARPENTER, F. NARIN, and P. R. MCALLISTER 6 Dec. 1982 95 p refs

(Contract NSF PRA-79-20587; CHI PROJ. 793-R)

(PB84-100734; NSF/PRA-82049) Avail: NTIS HC A05/MF A01 CSCL 05A

An assessment of the linkage between patents and fundamental research is described based on the extraction and analysis of the references in five rapidly growing subclasses of U.S. patents. References from the front page and body of more than 2000 U.S. patents were categorized as being references to other U.S. patents, to foreign patents, to the scientific journal literature or to other sources. The references to the scientific journal literature were further characterized according to their subject distribution, research level (applied to basic), age, institutional origins and support acknowledgements. In addition, the characteristics of the second generation of scientific literature (the papers cited by the papers directly cited by patents) were tabulated. GRA

N84-18115# Committee on Science and Technology (U. S. House).

JOINT INDUSTRY/UNIVERSITY COOPERATION WITH FEDERALLY SUPPORTED RESEARCH FACILITIES

Washington GPO 1983 180 p Hearing before the Subcomm. on Invest. and Oversight of the Comm. on Sci. and Technol., 98th Congr., 1st Sess., No. 32, 13 May 1983

(GPO-24-902) Avail: Subcommittee on Investigations and Oversight

Testimony is presented which examines how the joint use of federally supported research facilities might enhance the national research endeavor, reduce levels of direct taxpayer support, benefit the overall technology transfer process, and increase innovation and productivity. Particular attention is given to the use of unique facilities within large laboratory complexes for the solution of problems in agriculture, water research, and high technology. A.R.H.

N84-20432* National Aeronautics and Space Administration, Washington, D. C.

NASA PATENT ABSTRACTS BIBLIOGRAPHY. SECTION 1: ABSTRACTS

Jan. 1984 69 p

(NASA-SP-7039(24)-SECT-1; NAS 1.21:7039(24)-SECT-1) Avail: NTIS HC \$10.00 CSCL 05B

Abstracts are provided for 167 patents and patent applications entered into the NASA scientific and technical information system during the period July 1983 through December 1983. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or patent application. A.R.H.

N84-20433* National Aeronautics and Space Administration, Washington, D. C.

PATENT ABSTRACTS BIBLIOGRAPHY, A CONTINUING BIBLIOGRAPHY. SECTION 2: INDEXES

Jan. 1984 364 p

(NASA-SP-7039(24)-SECT-2; NAS 1.21:7039(24)-SECT-2) Avail: NTIS HC \$20.00 CSCL 05B

A subject index is provided for over 4300 patents and applications for patent for the period from May 1969 through December 1983. Additional indexes list personal authors, corporate authors, contract numbers, NASA case numbers, U.S. patent class numbers, U.S. patent numbers, and NASA accession numbers. A.R.H.

N84-21443# Committee on Commerce, Science, and Transportation (U. S. Senate).

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT, 1985

Washington GPO 1984 21 p H.R. 5154 enacted into law by the 92nd Congr., 2d Sess., 28 Mar. 1984

Avail: US Capitol, House Document Room

Appropriations to the National Aeronautics and Space Administration for research and development, space flight, control and data communications, construction of facilities, and research and program management, and for other purposes are authorized. The provisions of the bill are presented. S.L.

N84-21444# Committee on Science and Technology (U. S. House).

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT, 1985

Washington GPO 1984 22 p A bill, H.R. 5154, referred to the Comm. on Sci. and Technol., 98th Congr., 2d Sess., 15 Mar. 1984

(H-REPT-98-629) Avail: US Capitol, House Document Room

Appropriations are authorized to the National Aeronautics and Space Administration for research and development, space flight, control and data communications, construction of facilities, and research and program management, and for other purposes. The provisions of the bill are presented. S.L.

N84-22295# United Nations Industrial Development Organization, Vienna (Austria).

LICENSING COMPUTER SOFTWARE: BASIC CONSIDERATIONS AS TO PROTECTION AND LICENSING OF COMPUTER SOFTWARE AND ITS IMPLICATIONS FOR DEVELOPING COUNTRIES

3 Nov. 1982 27 p refs Presented at 7th Meeting of Heads of Technol. Transfer Registries, New Delhi, 7-10 Dec. 1982

(PB84-150689; UNIDO/WG.383/3-ADD-1) Avail: NTIS HC A03/MF A01 CSCL 09B

Definitions, overview of current patentability of computer software: USA, EEC, Japan; WIPO model provisions on the protection of computer software; protection of software in developing countries channels for transfer of software: custom software contracts; agreements for packaged software suggestions as to DCs approach toward licensing of software are covered. GRA

N84-23316# Air Force Business Research Management Center, Wright-Patterson AFB, Ohio.

NEEDED HELP FOR THE FEDERAL ACQUISITION REGULATION COUNCIL Final Report

C. D. WOODRUFF /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 122-127 1983

(AD-P002769) Avail: NTIS HC A24/MF A01 CSCL 15E

Writing and maintaining of the FAR regulation will be a tough job as it has been with the DAR. The subjects covered will be complex and technical. All available capabilities should be brought to bear in the process if regulations which are fair, which can be administered economically and which effectively accomplish their purposes are to be achieved. Discussion of a few aspects of DAR 1-324 Warranties and DAR 1-330 Contractor Liability for Damage to Government Property and the related contract clauses shows the two coverages to be deficient in many aspects. A need particularly for more and earlier assistance from industry in the writing of regulations is indicated. The experience and expertise of industry personnel should supplement that of the government personnel who will be rotated in and out of the FAR Council. A document with the impact the FAR will have deserves full use of available talent. Author (GRA)

N84-23324# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

NAILING DOWN THE LIABILITY ISSUE ONCE AND FOR ALL Final Report

W. C. PURSCH /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 175-183 1983

(AD-P002777) Avail: NTIS HC A24/MF A01 CSCL 15E

This paper contrasts the present Defense Acquisition Regulation requirements for liability determinations for loss, damage, or destruction of government property in the hands of contractors, with new guidance in the Federal Acquisition Regulation for property administrators and administrative contracting officers. Discussion includes the cumbersome method of shifting the liability for loss, damage, or destruction of government property by disapproving the contractor's property control system, and the liability clauses used in government contracts. The rationale behind the government's position as a self-insurer is presented, along with the procedure to follow in making liability decisions. Finally, certain conclusions are drawn with respect to strengthening the function of the property administrator, and the need for the support of the administrative contracting officer. Author (GRA)

N84-23325# Defense Contract Administration Services, Boston, Mass.

DOES THE PROMPT PAYMENT ACT INSURE TIMELY CONTRACT PAYMENT? Final Report

M. E. WILSON /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 179-180 1983

(AD-P002778) Avail: NTIS HC A24/MF A01 CSCL 15E

On 21 May 1982, President Reagan signed Public Law 97-177, the Prompt Payment Act, which has an objective of timely contract payment. Since the Act was implemented nearly one year ago, the question is: Does the Prompt Payment Act Insure Timely Contract Payment? This report addresses this question. GRA

N84-23378# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

CONTRACTOR FRAUD: GOVERNMENT RESPONSE Final Report

J. O. MAHOY /In AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 512-516 1983

(AD-P002833) Avail: NTIS HC A24/MF A01 CSCL 15E

Air Force Logistics support is adversely affected by the presence of fraud in Government contracts. Fraud occurs in the award of contracts, in the technical aspect of performance, and in the submission of false claims. Dishonest contractors, a small minority,

10 LEGALITY, LEGISLATION, AND POLICY

must be found out and brought to justice. The response of the Government is channeled along several lines. Fraud is both a civil and a criminal matter. The Government may sue for financial recompense and may also invoke criminal penalties, and may debar bidders. The Contracting Officer and eventually the whole contracting team may be needed to detect fraud. The using activity, the Office of Special Investigation, the FBI and ultimately the Justice Department attorney and Federal Court are involved.

Author (GRA)

N84-23388# Joint Publications Research Service, Arlington, Va.
INCENTIVES FOR NEW PRODUCTION DISCUSSED
A. S. KOLESNIKOV and V. V. STAROVIT *In its USSR Rept.: Sci. and Technol. Policy (JPRS-UST-84-004)* p 1-14 23 Feb. 1984 Transl. into ENGLISH from *Izv. Akad. Nauk SSSR: Ser. Ekon. (USSR)*, no. 4, Apr. 1983 p 37-46
Avail: NTIS HC A04

Patent policy and the incentives used to develop new technologies are examined. Patents are divided into three categories based on importance of the invention and government control of the license for foreign use. Possible incentive techniques and general suggestions for the development of a monetary bonus system for inventors is presented. M.A.C.

N84-24492# Office of Naval Research, London (England).
SCIENCE IN THE EUROPEAN ECONOMIC COMMUNITY: A SELF-ASSESSMENT AND A DETAILED PLAN OF ACTION
J. W. DANIEL 27 Jan. 1984 117 p
(AD-A139078; ONR-R-2-84) Avail: NTIS HC A06/MF A01 CSCL 05A

This report summarizes the European Economic Community's (EEC's) new scientific policy, provides the EEC Commission's assessment of the community's international position in science policy, and presents the detailed scientific and technological goals of a program for coordinating and planning future policy. GRA

N84-24503# Committee on Commerce, Science, and Transportation (U. S. Senate).
TRANSFER OF CIVIL METEOROLOGICAL SATELLITES
Washington GPO 1983 3 p Rept. to accompany S. 67 presented to the Comm. on Com., Sci. and Technol. 98th Congr., 1st Sess., 26 Sep. 1983
(S-REPT-98-260; GPO-11-010) Avail: US Capitol, Senate Document Room

The primary objective of this resolution is to curtail present efforts by the administration to all the Government's civil meteorological satellite (METSAT) systems by sending a definite signal that the Congress does not believe such a transfer is timely. Author

N84-24504# Committee on Small Business (U. S. House).
PAPERWORK REDUCTION ACT OF 1980
Washington GPO 1984 160 p Hearing before the Subcomm. on Govt. Regulation and Paperwork of the Comm. on Small Business, 98th Congr., 1st Sess., 15 Nov. 1983
(S-REPT-98-479; GPO-28-416) Avail: Subcommittee on Government Regulation and Paperwork

How Government paperwork requirements are affecting America's small businesses is examined with emphasis on the effectiveness of the 1980 Paperwork Reduction Act, Public Law 96-511. Some specific recommendations as to how the paperwork burden can be further reduced are advanced. A.R.H.

N84-24506# Committee on Commerce, Science, and Transportation (U. S. Senate).
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION BILL, 1984

Washington GPO 1984 41 p A bill, H.R. 5154, referred to the Comm. on Com., Sci. and Transportation, 98th Congr., 2d Sess., 14 May 1984
(S-REPT-98-455) Avail: US Capitol, Senate Document Room

The advanced communication technology satellite, space commercialization, space station development, and the design of

a single rotation or counter rotation turboprop are among the NASA research and development programs funded. Appropriations for other research and development activities are itemized as well as those for space flight, control, and data communication; construction, modification, and repairs to facilities; and program management. The National Commission on Space Act comprises Title 2 of the legislation. A.R.H.

N84-25526# Committee on Science and Technology (U. S. House).

THE 1985 NASA AUTHORIZATION

Washington GPO 1984 82 p Hearing before the Subcomm. on Transportation, Aviation and Mater. of the Comm. on Sci. and Technol., 98th Congr., 2d Sess., no. 69, 9 Feb. 1984
(GPO-31-453) Avail: Subcommittee on Transportation, Aviation and Materials

Budget requirements and appropriations for NASA research programs are examined. Current structures, aerodynamics, propulsion systems, flight controls, rotorcraft, and high performance aircraft research projects are discussed with particular emphasis on cost effectiveness and technological advancement. M.A.C.

N84-28408# Oakland Univ., Rochester, Mich. Dept. of Sociology.
RELEVANT AND IRRELEVANT LEGAL STRUCTURES: DISTINGUISHING PRIVATE SECTOR FROM DOD CONTRACTING

E. J. MCCABE *In AF Academy Proc. of the 9th Symp. on Psychol. in the DOD* p 25-29 Apr. 1984
(AD-P003241) Avail: NTIS HC A99/MF A01 CSCL 05J

Based on interview and observational data of contract formation and administration dealing with hardware and publications development by the U.S. Army Tank-Automotive Command, the social process of government contract law as an example of law in action is compared with the typical use of contracts between merchants in the private sector. While the formal law of contracts is, for the most part, irrelevant in normal business exchanges, the formal legal structure is found to be routinely relied upon in the case of government contracts. This unusual role of the formal law is explained by the absence of normal reciprocal relationships between contractors and the Government. Author (GRA)

N84-31038# Cardinal Management Associates, Inc., Washington, D.C.

APPROPRIATE TECHNOLOGY SMALL GRANTS PROGRAM EVALUATION, VOLUME 1: EXECUTIVE SUMMARY

Mar. 1984 26 p refs 3 Vol.
(Contract DE-AC01-82CE-15151)
(DE84-010675; DOE/CE-15151/1-VOL-1-EXEC-SUMM) Avail: NTIS HC A03/MF A01

Volume One contains the Executive Summary which provides a concise overview of the study, including a brief description of the Appropriate Technology Small Grants Program and of the study methodology, highlighted key findings and the Evaluation Team's policy recommendations. DOE

N84-31039# Cardinal Management Associates, Inc., Washington, D.C.

APPROPRIATE TECHNOLOGY SMALL GRANTS PROGRAM EVALUATION, VOLUME 2

Mar. 1984 149 p refs 3 Vol.
(Contract DE-AC01-82CE-15151)
(DE84-010674; DOE/CE-15151/1-VOL-2) Avail: NTIS HC A07/MF A01

An introduction to the Appropriate Technology Small Grants Program Evaluation is presented. Program background is presented, including history, guidelines and operation. The evaluation methodology is presented, specifically the problem statement, study limitations and study methodology. The findings of the study are presented and policy recommendations are discussed. DOE

N84-31044# General Accounting Office, Washington, D. C.
**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S
 FIRST-YEAR IMPLEMENTATION OF THE FEDERAL
 MANAGERS' FINANCIAL INTEGRITY ACT**

1 May 1984 33 p
 (PB84-188770; GAO/NSIAD-84-100; B-202205) Avail: NTIS HC
 A03/MF A01 CSCL 05A

GAO conducted a review of 22 federal agencies' efforts to implement the Federal Managers' Financial Integrity Act of 1982. The act was intended to help reduce fraud, waste, and abuse across the spectrum of federal government operations through annual agency self-assessments of their internal controls and accounting systems. This report highlights the progress made and problems encountered by NASA in its first year of experience with this new act. The report focuses on NASA's effort to evaluate internal controls, review accounting systems, and improve the evaluation processes as a result of identified problems. GRA

N84-34319# Committee on Science and Technology (U. S. House).

**THE ROLE OF INFORMATION TECHNOLOGY IN EMERGENCY
 MANAGEMENT**

Washington GPO 1984 159 p Hearings before the Subcomm. on Invest. and Oversight of the Comm. on Sci. and Technol., 98th Congr., 1st Sess., No. 63, 16-17 Nov. 1983
 (GPO-29-457) Avail: Subcommittee on Investigations and Oversight

The ability of the government to anticipate and respond to emergencies (crises) is assessed with emphasis on the adequacy of existing warning systems, ability to predict emergencies, response time, and sufficiency of current technology. The Federal Emergency Management Agency (FEMA) is described and pertinent issues are discussed, including: The cooperative use of information technology by governmental agencies and the private sector; the value of simulating emergency situations; establishment and utilization of analyst work stations; the current effectiveness of emergency operation centers; and other public policy issues.

S.B.

N84-34329# Committee on Science and Technology (U. S. House).

COMMERCIAL SPACE LAUNCH ACT

Washington GPO 1984 25 p Rept. to accompany H. R. 3942 presented by the Comm. on Sci. and Technol., 98th Congr., 2nd Sess., 31 May 1984
 (H-REPT-98-816; GPO-31-006) Avail: US Capitol, House Document Room

A congressional report of a bill which provides for the commercialization of expendable launch vehicles and associated services is presented. The bill provides for the promotion of economic growth in the United States by encouraging the private sector to provide space launch services and the utilization of space for peaceful purposes; the simplification and expedition of the process of licensing commercial launch operations and the facilitation of commercial application of government developed space technology; and the assignment of the principal responsibility to a single agency in the Executive Branch (DOT) the promotion and supervision of commercial launch operations and for the issuance and enforcement of licenses to conduct such activities.

E.R.

N84-34454# Federal Aviation Administration, Washington, D.C. Office of Airport Planning and Programming.

INTRODUCTION TO THE AIRPORT IMPROVEMENT PROGRAM

Nov. 1983 17 p
 (AD-A144556) Avail: NTIS HC A02/MF A01 CSCL 05A

To promote the development of a system to meet the Nation's needs, the Federal Government embarked on a grants in aid program to units of state and local government shortly after the end of World War II. This early program, the Federal aid airport program (FAAP), was authorized by the Federal airport act of 1946 and drew its funding from the general fund of the treasury. In 1970, a more comprehensive program was established with

the passage of the airport and airway development act of 1970. This act provided grants for airport planning under the planning grant program (PGP) and for airport development under the airport development aid program (ADAP). These programs were funded from a newly established airport and airway trust fund, into which were deposited revenues from several aviation user taxes on such items as airlines fares, air freight, and aviation fuel. The authority to issue grants under these two programs expired on September 30, 1981. During this 11 year period, 8,809 grants totalling \$4.5 billion were approved for airport planning and development. The current grant program, known as the airport improvement program (AIP), was established by the airport and airway improvement act of 1982; it continues to provide funding for airport planning and development, but under a single program. Funding through the Airport and Airway Trust Fund is also continued, along with many other features in the previous legislation. The 1982 Act also authorizes funds for noise compatibility planning and to carry out noise compatibility programs as set forth in the Aviation Safety and Noise Abatement Act of 1979 (P.L. 96-193). GRA

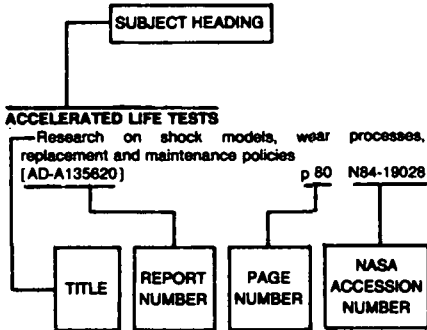
N84-35134# Committee on Science and Technology (U. S. House).

**REVIEW OF THE NATIONAL AERONAUTICS AND SPACE ACT
 OF 1958, AS AMENDED**

Washington GPO 1984 60 p refs Presented by the Subcomm. on Space Sci. and Appl. to the Comm. on Sci. and Technol., 98th Congr., 2d Sess., Sep. 1984
 (GPO-38-705) Avail: Subcommittee on Space Science and Applications

A review of the National Aeronautics and Space Act of 1958 is provided based on hearings held by the Subcommittee on Space Science and Applications. The consensus view was that the National Aeronautics and Space Act is a sound piece of legislation that has reliably served the nation. Various speakers were in favor of increasing private sector involvement in future space activities. Others said that it was neither practical or desirable to turn the Space Transportation System over to a commercial venture. The issues discussed were: adequacy of the policy objectives of the National Aeronautics and Space Act of 1958; The need for long range planning; Adequacy of space policy advisory apparatus; management of shuttle operations; NASA's role in commercialization; NASA and national security; space science; international cooperation in space; the space station; program balance at NASA; need for a fifth orbiter; and potentials for a strong space applications program. S.B.

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of the document content, the title extension is added, separated from the title by three hyphens. The (NASA or AIAA) accession number and the page number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable, a report number is also included as an aid in identifying the document. Under any one subject heading, the accession numbers are arranged in sequence with the AIAA accession numbers appearing first.

A

- ABILITIES**
Performance appraisal revisited
[AD-A132841] p 3 N84-16059
- ABSTRACTS**
Mechanized contract document preparation and abstract system
[AD-P002750] p 49 N84-23297
Proceedings of the 2nd International Workshop on Statistical Database Management
[DE84-005866] p 52 N84-25522
- ACCELERATED LIFE TESTS**
Research on shock models, wear processes, replacement and maintenance policies
[AD-A135620] p 80 N84-19028
- ACCIDENT PREVENTION**
Safety training priorities
[AD-A141711] p 95 N84-29026
- ACCOUNTING**
The establishment of prices and costs
p 66 A84-15315
The recording of outlays and the projection of completion
p 67 A84-15317
Integrated budget control using a desktop computer
p 70 N84-14697
Cost accounting standards: A time for government and industry action
[AD-P002767] p 72 N84-23314
Paperwork Reduction Act of 1980
[S-REPT-98-479] p 102 N84-24504
An analysis of naval aviation configuration status accounting
[AD-A140473] p 84 N84-26460
Contract audit followup: Its impact on defense contracting
[DE-A140627] p 85 N84-27587

- National Aeronautics and Space Administration's first-year implementation of the Federal Managers' Financial Integrity Act
[PB84-188770] p 103 N84-31044
Cost and schedule control systems criteria for contract performance measurement, information pamphlet
[DE84-012576] p 78 N84-32269
- ACCURACY**
Future directions in large-scale scientific computing
[DE83-013229] p 40 N84-10807
Personnel technology: Performance appraisal, a process approach
[AD-A138359] p 4 N84-23112
- ACQUISITION**
Management of logistic support costs in the equipment acquisition phase
p 79 A84-15213
Productivity improvement in a purchase division: Evaluation of a Performance Contingent Reward System (PCRS)
[AD-A133589] p 71 N84-16801
Multiyear subcontractor selection criteria analysis
[AD-A135638] p 80 N84-19126
A quality improvement strategy for systems acquisition
[AD-P002820] p 94 N84-23365
Improving system affordability
[AD-A142387] p 77 N84-31062
Comparative analysis of government and private sector ADP acquisition
[AD-A144523] p 59 N84-35131
- ACTIVITY CYCLES (BIOLOGY)**
Biological clocks and shift work scheduling
[GPO-29-312] p 6 N84-25277
- ADA (PROGRAMMING LANGUAGE)**
Coherent management support in the Ada environment
p 43 N84-14748
Ada and the NASA software environment
p 43 N84-14749
ANSI Ada and the UK M-CHAPSE
p 91 N84-14760
Evaluation of automated configuration management tools in ADA programming support environments
[AD-A140982] p 53 N84-28666
Configuration management with the Ada (trademark) language
[AD-P003416] p 55 N84-30748
Ada (Trademark) training considerations
[AD-P003560] p 10 N84-31164
- ADAPTIVE CONTROL**
Research in adaptive control hybrid and constrained structure systems
[AD-A140496] p 20 N84-26345
- AERONAUTICAL ENGINEERING**
Engineering aspects of international cooperation in aeronautics
p 26 A84-44927
Future of aeronautics
[GPO-29-744] p 30 N84-25529
- AEROSPACE ENGINEERING**
Computer-assisted engineering data base
[ASME PAPER 83-WA/AERO-11] p 32 A84-30608
Evolution in aerospace engineering organization
p 26 A84-32774
The role of quality assurance in the development of software for space applications
p 91 N84-14743
Spinoff, 1984
[NASA-TM-85596] p 65 N84-33305
- AEROSPACE INDUSTRY**
The industrial just return principle
p 25 A84-10399
Human organization — and space project management
p 59 A84-15303
The contract — management for space projects
p 60 A84-15304
The progression of projects — in space industry
p 60 A84-15305
Management of a space project
p 60 A84-15306
Configuration and documentation management — for spacecraft development
p 38 A84-15309
Management of large space projects - Quality assurance or 'product assurance'
p 89 A84-15310
Methods and practices of planning - Physical planning, resources, financial simulation
p 12 A84-15312
Cost estimation and estimate analysis — for project planning and management
p 67 A84-15316

- Design to cost — applied to aerospace industry
p 25 A84-15319
- The management of large projects - Case study:
Ariane
p 60 A84-15324
The law applicable to contracts on space activities
[IAF PAPER 82-IISL-39] p 96 A84-17055
Aerospace technology and commercial nuclear power; Proceedings of the Workshop Conference, Williamsburg, VA, November 18-20, 1981 — Book
p 25 A84-19449
Contemporary business outlook for large space ventures
Financing, management, construction
[AAS PAPER 83-242] p 68 A84-29881
International competition in commercial aerospace markets
[AAS PAPER 83-244] p 68 A84-29883
The workload of European space industry - Current situation and foreseeable trends
p 26 A84-38468
Legal status of memoranda of understanding in the United States
p 99 A84-38475
Space commercialization
[GPO-22-870] p 70 N84-10108
Impact of corporate resource allocation decisions on national security objectives: Dissynergism in aerospace industrial resource planning
[AD-P002801] p 29 N84-23347
The Score technique: An analytical approach for assessing the results of manufacturing reviews
[AD-P002838] p 30 N84-23383
Project management in the 80's
[MBB-UR-631-83-O] p 65 N84-26454
Guide to Canadian aerospace related industries
[AD-A140606] p 30 N84-26650
Evaluating the availability, role, and performance of subcontractors in the aerospace industry
[AD-A141408] p 85 N84-29788
- AEROSPACE MEDICINE**
Regulations and the air ambulance
p 97 A84-24961
- AEROSPACE SYSTEMS**
Future of aeronautics
[GPO-29-744] p 30 N84-25529
Air force technical objective document FY 85
[AD-A141925] p 86 N84-31033
- AEROSPACE TECHNOLOGY TRANSFER**
Aerospace technology and commercial nuclear power; Proceedings of the Workshop Conference, Williamsburg, VA, November 18-20, 1981 — Book
p 25 A84-19449
Encouraging business ventures in space technologies
[AAS PAPER 83-246] p 68 A84-29885
Report format preferences of technical managers and nonmanagers
p 40 A84-45572
Programs designed to help small businesses commercialize devices invented by NASA, DOD, and other federal agencies - A case history
p 70 A84-49413
Space commercialization
[GPO-22-870] p 70 N84-10108
Policy and legal issues involved in the commercialization of space
[GPO-21-495] p 100 N84-11069
Spinoff, 1984
[NASA-TM-85596] p 65 N84-33305
- AEROSPACE VEHICLES**
Future of aeronautics
[GPO-29-744] p 30 N84-25529
- AGING (BIOLOGY)**
Age effects on active duty Army MMPI (Minnesota Multiphasic Personality Inventory) profiles
[AD-P003343] p 9 N84-28464
- AGRICULTURE**
Workshop on Systems Analysis
[PB84-194661] p 24 N84-33138
- AIR LAW**
Product liability in aviation and its insurability
p 96 A84-11311
Aviation - The need for uniform legislation
p 96 A84-14048
Government liability under the Federal Tort Claims Act for negligent inspection and certification of aircraft
p 96 A84-20150
The liability of the United States for negligent inspection
1983
p 97 A84-20454

- The growth of American judicial hostility towards the liability limitations of the Warsaw convention p 97 A84-20456
- Impact of current U.S. policy on international civil aviation p 97 A84-20675
- Regulations and the air ambulance p 97 A84-24961
- Airworthiness directives - Recovering the cost of compliance p 97 A84-25032
- Air carrier liability under deregulation p 97 A84-25033
- Aircraft accident investigation procedures in Japan p 98 A84-27410
- Aircraft accident enquiries - Whose interest prevails? p 98 A84-27412
- NTSB procedures - United States National Transportation Safety Board p 98 A84-27416
- Effects of FAR 25.1309 on airplane operation and maintenance [SAE PAPER 831405] p 98 A84-29626
- The effect of regulation 25.1309 on aircraft design and maintenance [SAE PAPER 831406] p 98 A84-29627
- The Warsaw Convention - A discussion of the present position p 99 A84-44854
- AIR TRAFFIC**
- National Airspace Review: Implementation plan [AD-A145379] p 86 N84-31107
- AIR TRAFFIC CONTROL**
- Flight test airspace - A vital part of the plan [AIAA PAPER 83-2711] p 78 A84-12316
- The O'Hare Runway Configuration Management System p 79 A84-44732
- Improving the air traffic control system: An assessment of the National Airspace System Plan p 80 N84-16160
- AN/TPN-19 improvements program management plan [AD-A140728] p 84 N84-26690
- Study of the FAA (Federal Aviation Administration) program to modernize maintenance operations [AD-A142295] p 86 N84-29848
- National Airspace Review: Implementation plan [AD-A145379] p 86 N84-31107
- AIR TRAFFIC CONTROLLERS (PERSONNEL)**
- The national air-space system contingency plan p 78 A84-10416
- Airspace management can be improved p 78 A84-12185
- AIRBORNE/SPACEBORNE COMPUTERS**
- Software control and system configuration management - A process that works p 38 A84-26713
- Avionics software management and control p 39 A84-26714
- Software control and system configuration management: A systems-wide approach [NASA-TM-85908] p 56 N84-31112
- Some management initiatives to improve embedded commercial computer and training device life cycle support [AD-P003494] p 11 N84-32260
- AIRCRAFT ACCIDENT INVESTIGATION**
- The liability of the United States for negligent inspection 1983 p 97 A84-20454
- The growth of American judicial hostility towards the liability limitations of the Warsaw convention p 97 A84-20456
- Aircraft accident investigation procedures in Japan p 98 A84-27410
- Aircraft accident enquiries - Whose interest prevails? p 98 A84-27412
- NTSB procedures - United States National Transportation Safety Board p 98 A84-27416
- The Warsaw Convention - A discussion of the present position p 99 A84-44854
- AIRCRAFT ACCIDENTS**
- Airspace management can be improved p 78 A84-12185
- Aviation - The need for uniform legislation p 96 A84-14048
- AIRCRAFT CONSTRUCTION MATERIALS**
- Air force technical objective document FY 85 [AD-A141925] p 86 N84-31033
- AIRCRAFT DESIGN**
- Reliability program development and implementation for a remote piloted vehicle p 88 A84-15208
- The effect of regulation 25.1309 on aircraft design and maintenance [SAE PAPER 831406] p 98 A84-29627
- The influence of Computer Aided Design (CAD) on research - aircraft design [NLR-MP-83026-U] p 36 N84-31984
- AIRCRAFT ENGINES**
- Advances in manufacturing technology p 31 A84-28014
- AIRCRAFT EQUIPMENT**
- Product liability in aviation and its insurability p 96 A84-11311

AIRCRAFT INDUSTRY

- Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 3 [AD-A131878] p 27 N84-12051
- Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 2 [AD-A131877] p 27 N84-12052
- Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary [AD-A131876] p 27 N84-12053
- Competitive assessment of the U.S. Civil aircraft industry [PB84-154913] p 76 N84-25525
- Guide to Canadian aerospace related industries [AD-A140606] p 30 N84-26650
- Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1) [AD-A143072] p 36 N84-31973
- ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing. Volume 4, part 5, task D: Quality assurance/quality, control/technical requirement/tasks, quality assurance modeling and analysis, architecture for product assurance, (TTD) [AD-A144691] p 37 N84-34999
- AIRCRAFT MAINTENANCE**
- Effects of FAR 25.1309 on airplane operation and maintenance [SAE PAPER 831405] p 98 A84-29626
- The effect of regulation 25.1309 on aircraft design and maintenance [SAE PAPER 831406] p 98 A84-29627
- Airline Maintenance Management System (AMMS) p 79 A84-46582
- The aircraft availability model: Conceptual framework and mathematics [AD-A132927] p 79 N84-14115
- Naval aviation IMA repair capability: A readiness to resources approach [AD-A140465] p 84 N84-25612
- AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition [AD-A144045] p 87 N84-33366
- Improvements in work of aircraft repair plant no. 402 p 88 N84-34425
- AIRCRAFT MANEUVERS**
- Configuration control methodology for system performance enhancement [AIAA PAPER 84-1942] p 14 A84-43469
- AIRCRAFT PRODUCTION**
- The fine art of accepting an airliner p 25 A84-11274
- AIRCRAFT PRODUCTION COSTS**
- The 'affordable' fighter market p 68 A84-20599
- An innovative approach to supplier cost control p 69 A84-46348
- An automated airframe production cost model [AD-P002787] p 74 N84-23334
- AIRCRAFT RELIABILITY**
- Reliability program development and implementation for a remote piloted vehicle p 88 A84-15208
- Airworthiness directives - Recovering the cost of compliance p 97 A84-25032
- Effects of FAR 25.1309 on airplane operation and maintenance [SAE PAPER 831405] p 98 A84-29626
- The effect of regulation 25.1309 on aircraft design and maintenance [SAE PAPER 831406] p 98 A84-29627
- AIRCRAFT SAFETY**
- Government liability under the Federal Tort Claims Act for negligent inspection and certification of aircraft p 96 A84-20150
- Aircraft accident investigation procedures in Japan p 98 A84-27410
- NTSB procedures - United States National Transportation Safety Board p 98 A84-27416
- The effect of regulation 25.1309 on aircraft design and maintenance [SAE PAPER 831406] p 98 A84-29627
- The Aviation Safety Analysis System (ASAS) - An overview p 90 A84-41079
- System safety in aircraft acquisition [AD-A141492] p 95 N84-28763
- AIRCRAFT SPECIFICATIONS**
- Managing aircraft/simulator concurrency [AD-P003463] p 86 N84-32240
- AIRLINE OPERATIONS**
- The national air-space system contingency plan p 78 A84-10416
- The fine art of accepting an airliner p 25 A84-11274

- The growth of American judicial hostility towards the liability limitations of the Warsaw convention p 97 A84-20456
- Air carrier liability under deregulation p 97 A84-25033
- Analysis of the influence of the load factor in planning aircraft transport capacity p 68 A84-25192
- Aircraft accident enquiries - Whose interest prevails? p 98 A84-27412
- Effects of FAR 25.1309 on airplane operation and maintenance [SAE PAPER 831405] p 98 A84-29626
- Deregulation and commuter airline safety p 89 A84-36942
- The Warsaw Convention - A discussion of the present position p 99 A84-44854
- Airline Maintenance Management System (AMMS) p 79 A84-46582
- Deregulating the airlines: An economic analysis [PB83-250019] p 100 N84-14070
- AIRPORT PLANNING**
- The O'Hare Runway Configuration Management System p 79 A84-44732
- AIRPORTS**
- Introduction to the airport improvement program [AD-A144556] p 103 N84-34454
- AIRSPACE**
- Flight test airspace - A vital part of the plan [AIAA PAPER 83-2711] p 78 A84-12316
- National Airspace Review: Implementation plan [AD-A145379] p 86 N84-31107
- ALGORITHMS**
- Human factors products: A one-act play with epilogue [AD-A133354] p 3 N84-16811
- Computer networks without a shared memory AFOSR-81-0197 p 45 N84-17927
- Research agenda in non-linear decision systems [PB84-161207] p 19 N84-24102
- Research in adaptive control hybrid and constrained structure systems [AD-A140496] p 20 N84-26345
- ALLOCATIONS**
- Appropriate Technology Small Grants Program evaluation, volume 1: Executive summary [DE84-010675] p 102 N84-31038
- Appropriate Technology Small Grants Program evaluation, volume 2 [DE84-010674] p 102 N84-31039
- Equitable assignment rules [AD-A142809] p 24 N84-32268
- AMBULANCES**
- Regulations and the air ambulance p 97 A84-24961
- ANALOGS**
- Analysis of modern analog and digital communication channels from a manager's perspective [AD-A143161] p 57 N84-31494
- ANALYSIS OF VARIANCE**
- An analysis of the acquisition strategy decision process along three dimensions of the acquisition improvement program [AD-P002758] p 18 N84-23305
- APPROPRIATIONS**
- National Aeronautics and Space Administration Authorization Act, 1985 p 101 N84-21443
- National Aeronautics and Space Administration Authorization Act, 1985 [H-REPT-98-629] p 101 N84-21444
- National Aeronautics and Space Administration Authorization Bill, 1984 [S-REPT-98-455] p 102 N84-24506
- APPROXIMATION**
- Future directions in large-scale scientific computing [DE83-013229] p 40 N84-10807
- Disjunctive programming and a hierarchy of relaxations for discrete optimization problems [AD-A132004] p 15 N84-12784
- ARCHITECTURE (COMPUTERS)**
- Computer research in Japan p 39 A84-31347
- A total system design framework p 39 A84-41201
- Computer system design environment software development plan [AD-A131651] p 41 N84-12747
- A technical overview of the National Software Works [AD-A132320] p 42 N84-13827
- Integrated Computer-Aided Manufacturing (ICAM) architecture part 3. Volume 1: Architecture part 3: Accomplishments [AD-A134249] p 33 N84-16829
- Benchmarking the selection and projection operations and ordering capabilities of relational database machines [AD-A136776] p 46 N84-20438

- Software quality measurement for distributed systems. Volume 3: Distributed computing systems. Impact on software quality [AD-A137957] p 92 N84-21130
- A survey of European robotics research [AD-A138952] p 34 N84-23122
- Design and performance of a distributed relational data base system [AD-A142177] p 54 N84-29495
- LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 1 [AD-A141396] p 54 N84-29786
- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 5: Composite function model of manufacture product (MFG0) [AD-A142337] p 35 N84-30766
- Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, volume 4: Composite information model of design product (DES 1) [AD-A142447] p 36 N84-30774
- Standards and integrated avionic digital system architecture [AD-P003561] p 95 N84-31166
- Defense industry attitudes about AF interface standards report of an electronics industries association survey [AD-P003570] p 95 N84-31175
- Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, volume 6: Composite information model of 'Manufacture product' (MFG1) [AD-A143072] p 36 N84-31973
- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 7: MFG01 glossary [AD-A144426] p 36 N84-34991
- ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing. Volume 4, part 5, task D: Quality assurance/quality, control/technical requirement/tasks, quality assurance modeling and analysis, architecture for product assurance, (TTD) [AD-A144691] p 37 N84-34999
- ARIANE LAUNCH VEHICLE**
- The management of large projects - Case study: Ariane [AD-A145324] p 60 A84-15324
- ARMED FORCES (UNITED STATES)**
- Air Force Systems Command research planning guide (research objectives) [AD-A138851] p 64 N84-23384
- An overview of productivity improvement efforts in Army organizations [AD-A138589] p 19 N84-24490
- Now: An initial approach to collection of major material systems actual costs [AD-A139845] p 76 N84-25505
- Increasing competition for spares within AFCL (Air Force Logistics Command) [AD-A140751] p 85 N84-27588
- Situational interaction: A peer counseling approach to AWOL (unauthorized absences from duty) reduction [AD-P003243] p 7 N84-28410
- Evaluation of the BCT (Basic Cadet Training) paraprofessional counselor training at the United States Air Force Academy [AD-P003244] p 7 N84-28411
- Leadership, managership, and computers in today's Air Force [AD-P003351] p 22 N84-28468
- Research integration: An essential for Department of Defense psychological research [AD-P003366] p 65 N84-28479
- A field study of Air Force organization structures [AD-A142389] p 23 N84-31035
- A model of inter-organizational influences on organizational processes [AD-A142450] p 23 N84-31037
- A comparison of simulator procurement/program practices: Military versus commercial [AD-P003453] p 86 N84-32230
- Proceedings of the 5th Interservice-Industry Training Equipment Conference, volume 2 [AD-A142775] p 11 N84-32266
- ARPA COMPUTER NETWORK**
- A technical overview of the National Software Works [AD-A132320] p 42 N84-13827
- ARTIFICIAL INTELLIGENCE**
- Navy AI programs - With emphasis on applications - Artificial Intelligence [AIAA PAPER 83-2349] p 31 A84-10022
- Japan's next generation of robots [AD-A140982] p 53 N84-28666
- Recommendations for NASA research and development in artificial intelligence [NASA-CR-170585] p 32 N84-11817
- Artificial intelligence implications for information retrieval [AD-A131382] p 32 N84-11821

- Artificial intelligence techniques for industrial applications in job shop scheduling [AD-A132164] p 32 N84-13867
- Artificial intelligence applications to maintenance technology working group report IDA/OSD R and M (Institute for Defense Analyses/Office of the Secretary of Defense Reliability and Maintainability) study [AD-A137329] p 33 N84-19827
- A knowledge-based system for LP (Linear Programming) modeling [AD-A139991] p 35 N84-25357
- Applying artificial intelligence to large networks [AD-A139991] p 35 N84-25357
- Impact of robots and computers on the work force of the 1980's [GPO-31-912] p 36 N84-32826
- Mid-robots get underway in September: Lab-industry link [AD-A139991] p 36 N84-34649
- Report of the Information Technology Workshop [AD-A144212] p 37 N84-35126
- ASSESSMENTS**
- Priorities for detailed quality assessments of the National Defense Stockpile nonfuel materials [NMAAB-403] p 93 N84-23011
- ASSURANCE**
- Management input in quality [AD-A139991] p 92 N84-17602
- Design QA on a small batch project [AD-A139991] p 92 N84-17603
- Measuring quality achievements [AD-A139991] p 92 N84-17605
- Product assurance management and audit systems for ESA spacecraft and associated equipment [ESA-PSS-01-10-ISSUE-1] p 95 N84-26035
- ASYMPTOTIC METHODS**
- Age effects on active duty Army MMPI (Minnesota Multiphasic Personality Inventory) profiles [AD-P003343] p 9 N84-28464
- AUTOMATA THEORY**
- A survey of European robotics research [AD-A138952] p 34 N84-23122
- AUTOMATIC CONTROL**
- Automated storage and retrieval systems--a consolidation of guidance for project management and implementation [AD-A135571] p 80 N84-19175
- Research in man-machine interaction discussed [AD-A135571] p 80 N84-19175
- LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 1 [AD-A141396] p 54 N84-29786
- LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 2 [AD-A141397] p 54 N84-29787
- Local automation model: System specification [AD-A141503] p 54 N84-29798
- Automated Construction Management System (ACMS). Volume 1: User's guide [AD-A143031] p 30 N84-31971
- Academician Varnos interviewed on automation related problems [AD-A143031] p 36 N84-34972
- AUTOMATIC FLIGHT CONTROL**
- Software control and system configuration management - A process that works [AD-A143031] p 38 A84-26713
- Software control and system configuration management: A systems-wide approach [NASA-TM-85908] p 56 N84-31112
- AUTOMATIC TEST EQUIPMENT**
- MATE standardization [AD-P003587] p 95 N84-31192
- AUTOMATION**
- Automating the configuration management process [AD-A143031] p 38 A84-16633
- Automated spacecraft health and status [AIAA PAPER 84-0685] p 31 A84-25276
- General Purpose Electronic Test Equipment (GPETE) acquisition considerations for automated calibration [AD-A133865] p 91 N84-14709
- A program for developing automated scientific-information processing in maritime economy [AD-A135518] p 45 N84-18107
- Office automation in the acquisition environment [AD-P002747] p 49 N84-23294
- USSR report: Machine tools and metalworking equipment [JPRS-UMM-84-008] p 34 N84-23913
- Industry official on progress in Soviet robotics program [AD-A133865] p 35 N84-23915
- Evaluation of automated configuration management tools in ADA programming support environments [AD-A140982] p 53 N84-28666
- I/O channel interface [NBS-FIPS-PUB-60-2] p 57 N84-33057
- A study of the extent of automation in small college libraries and relationships of attitudes of library directors toward it [NBS-FIPS-PUB-60-2] p 58 N84-33260

AUTOMOBILES

- Saab claims world's most modern engine-assembly plant [AD-A133503] p 34 N84-23800

AVIONICS

- The avionics integrity program (AVIP) [AD-P002817] p 93 N84-23362
- Standards and integrated avionic digital system architecture [AD-P003561] p 95 N84-31166
- Defense industry attitudes about AF interface standards report of an electronics industries association survey [AD-P003570] p 95 N84-31175

B**BEHAVIOR**

- An exploratory analysis of the relationship between media richness and managerial information processing [AD-A143503] p 24 N84-33293

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- NASA Patent Abstracts Bibliography. Section 2: Indexes. A continuing bibliography (supplement 23) [NASA-SP-7039(23)-SECT-2] p 100 N84-13018
- NASA patent abstracts bibliography. Section 1: Abstracts [NASA-SP-7039(24)-SECT-1] p 101 N84-20432
- Patent abstracts bibliography, a continuing bibliography. Section 2: Indexes [NASA-SP-7039(24)-SECT-2] p 101 N84-20433
- SIRIUS: Bibliographic search and retrieval system [INPE-2771-PRE/344] p 52 N84-25512
- Management. A continuing bibliography for NASA managers, with indexes [NASA-SP-7500(18)] p 20 N84-26429
- Matrix management in DoD: An annotated bibliography [AD-A143316] p 24 N84-33253

BINOMIALS

- On using selection procedures with binomial models [AD-A135275] p 16 N84-17957

BIOCHEMISTRY

- Psychological and biochemical effects of a stress management program [AD-P003300] p 7 N84-28447

BIOMASS

- Appropriate technology management information system [DE84-010952] p 56 N84-31056

BOEING 757 AIRCRAFT

- The fine art of accepting an airliner [AD-A135275] p 25 A84-11274

BOMBER AIRCRAFT

- US military aircraft cost handbook [AD-A136035] p 71 N84-18158

BRANCHING (MATHEMATICS)

- On a series of problems with machines: Costs of modernization and storage in case of demand [TUM-M8312] p 30 N84-25863

BUDGETING

- Integrated budget control using a desktop computer [AD-A135275] p 70 N84-14697
- Computerised plant control system [AD-A135275] p 27 N84-14698
- An evaluation of the system 2000 data base management system for use in major item system mapping [DE84-011310] p 87 N84-32296

BUDGETS

- Use of economic mechanisms in managing scientific and technical progress [AD-A135275] p 76 N84-23389
- Computer developments at Institute of Automation and Electrometry described [AD-A135275] p 34 N84-23390

BUS CONDUCTORS

- General Purpose Electronic Test Equipment (GPETE) acquisition considerations for automated calibration [AD-A133865] p 91 N84-14709

C**CANADA**

- Guide to Canadian aerospace related industries [AD-A140606] p 30 N84-26650

CELESTIAL BODIES

- Spinoff, 1984 [NASA-TM-85596] p 65 N84-33305

CERTIFICATION

- The liability of the United States for negligent inspection 1983 [AD-A135275] p 97 A84-20454

CHANNEL CAPACITY

- I/O channel interface [NBS-FIPS-PUB-60-2] p 57 N84-33057

CHANNELS (DATA TRANSMISSION)

- Gridnet - An alternative large distributed network
p 39 A84-31351
- Analysis of modern analog and digital communication channels from a manager's perspective
[AD-A143161] p 57 N84-31494
- CIRCADIAN RHYTHMS**
- Biological clocks and shift work scheduling
[GPO-21-747] p 2 N84-12713
- Biological clocks and shift work scheduling
[GPO-29-312] p 6 N84-25277
- CIVIL AVIATION**
- The national air-space system contingency plan
p 78 A84-10416
- Aviation - The need for uniform legislation
p 96 A84-14048
- Impact of current U.S. policy on international civil aviation
p 97 A84-20675
- Air carrier liability under deregulation
p 97 A84-25033
- Aircraft accident investigation procedures in Japan
p 98 A84-27410
- Aircraft accident enquiries - Whose interest prevails?
p 98 A84-27412
- NTSB procedures -- United States National Transportation Safety Board
p 98 A84-27416
- Advances in manufacturing technology
p 31 A84-28014
- Deregulation and commuter airline safety
p 99 A84-36942
- Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 3
[AD-A131878] p 27 N84-12051
- Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 2
[AD-A131877] p 27 N84-12052
- Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary
[AD-A131876] p 27 N84-12053
- Information resources management plan
[AD-A131964] p 41 N84-13023
- Deregulating the airlines: An economic analysis
[PB83-250019] p 100 N84-14070
- Voluntary accounting systems for a small air carrier: Revenues, financial and traffic statistics
[PB84-210996] p 78 N84-32369
- Improvements in work of aircraft repair plant no. 402
p 88 N84-34425
- COBOL**
- Analyzing program methodologies using software science
[AD-A138121] p 93 N84-22259
- COGNITION**
- Applied cognitive science
[AD-A136780] p 4 N84-20185
- Decision theory: Individual biases and their effect on forecasting in an organization
[AD-A137943] p 17 N84-21395
- Interaction of human cognitive models and computer-based models in supervisory control
[AD-A142677] p 23 N84-30717
- COGNITIVE PSYCHOLOGY**
- An interactive system for supporting multiobjective decision making
p 13 A84-21643
- Analogy in systems management - A theoretical inquiry
p 13 A84-25008
- Applied cognitive science
[AD-A136780] p 4 N84-20185
- COLLISION AVOIDANCE**
- System safety in aircraft acquisition
[AD-A141492] p 95 N84-28763
- COMBAT**
- Artificial intelligence applications to maintenance technology working group report IDA/OSD R and M (Institute for Defense Analyses/Office of the Secretary of Defense Reliability and Maintainability) study
[AD-A137329] p 33 N84-19827
- COMBINATORIAL ANALYSIS**
- On the facial structure of scheduling polyhedra
[AD-A136983] p 17 N84-20427
- COMMAND AND CONTROL**
- A concept for mission-oriented planning for system acquisition at the Defense Communications Agency
[AD-P002823] p 19 N84-23368
- Environments for evaluating performance of C3I (Command, Control, Communications, and Intelligence) systems
[AD-P003237] p 21 N84-28404
- COMMERCE**
- Should there be a mortgage convention for space activity investors?
[IAF PAPER 82-HSL-52] p 67 A84-17063
- Contemporary business outlook for large space ventures
Financing, management, construction
[AAS PAPER 83-242] p 68 A84-29881

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[NASA-CR-173688] p 77 N84-27756
- Commentary on Philips R and D strategy, policies, major efforts
p 66 N84-34647
- COMMERCIAL AIRCRAFT**
- Analysis of the influence of the load factor in planning aircraft transport capacity
p 68 A84-25192
- A comparison of simulator procurement/program practices: Military versus commercial
[AD-P003453] p 86 N84-32230
- COMMERCIAL SPACECRAFT**
- Encouraging business ventures in space technologies
[AAS PAPER 83-246] p 68 A84-29885
- Commercial Space Launch Act
[H-REPT-98-816] p 103 N84-34329
- COMMUNICATING**
- Toward an interpersonal paradigm for superior-subordinate communication
[AD-A135863] p 17 N84-20166
- Strategies and mechanisms for the diffusion of scientific and technical information: A comparative study
p 51 N84-23406
- The impact of communicating through computers
p 53 N84-27457
- The role of information technology in emergency management
[GPO-29-457] p 103 N84-34319
- COMMUNICATION**
- Office automation: A look beyond word processing
[AD-A132764] p 53 N84-28670
- Proceedings of the 5th Interservice-Industry Training Equipment Conference, volume 2
[AD-A142775] p 11 N84-32266
- COMMUNICATION CABLES**
- Analysis of modern analog and digital communication channels from a manager's perspective
[AD-A131811] p 57 N84-31494
- COMMUNICATION EQUIPMENT**
- A concept for mission-oriented planning for system acquisition at the Defense Communications Agency
[AD-P002823] p 19 N84-23368
- Report on U.S. domestic and international telecommunications and information markets
[PB84-166362] p 77 N84-27602
- COMMUNICATION NETWORKS**
- NU - A network monitoring, control, and management system
p 40 A84-49262
- Research in network management techniques for tactical data communications networks
[AD-A131357] p 40 N84-11365
- Technical and economic analysis of the planned visual display terminal employment for the Stock Point Logistics Integrated Communications Environment (SPLICE)
[AD-A133642] p 80 N84-14711
- An exploratory study of the use of an inexpensive cordless telephone as a part of a data communications link -- management information in hospitals
[AD-A134228] p 44 N84-16432
- Recommended test and evaluation and independent verification and validation actions for the Defense Data Network
[AD-A134167] p 44 N84-17049
- Paperless solicitation and contracting
[AD-P002749] p 49 N84-23296
- The ROE file system
[AD-A140497] p 52 N84-26473
- Study of the FAA (Federal Aviation Administration) program to modernize maintenance operations
[AD-A142295] p 86 N84-29848
- Communication networks
p 58 N84-33356
- COMMUNICATION SATELLITES**
- Commercial communications satellite market and technology in the 90's
[IAF PAPER 83-86] p 66 A84-11739
- Reliability programs for commercial communication satellites
p 88 A84-15209
- Space insurance - Issues and problems
p 96 A84-16892
- Some technical and contractual aspects of transponder leasing by EUTELSAT
p 79 A84-20645
- Automated spacecraft health and status
[AIAA PAPER 84-0685] p 31 A84-25276
- The technical and economic considerations of bringing satellite communications to small mobile users
p 69 A84-37900
- Reliability in space: Program manager and user awareness
[AD-P002148] p 94 N84-23813
- COMPARISON**
- On 'Before' and 'After' cost comparisons
[AD-P002799] p 75 N84-23345
- COMPATIBILITY**
- Conflicts among employees and ways of resolving them
p 1 A84-14980

COMPETITION

- Role of technology in promoting industrial competitiveness
[S-REPT-98-565] p 29 N84-19605
- Competitive procurements: The synergistic linkage among government, industry and academe
[AD-P002773] p 73 N84-23320
- Competition: An integral part of the acquisition process
[AD-P002774] p 73 N84-23321
- Increasing spares competition in AFLC (Air Force Logistics Center)
[AD-P002775] p 81 N84-23322
- Value and competition
[SNIAS-832-501-101] p 76 N84-25504
- Competitive assessment of the U.S. Civil aircraft industry
[PB84-154913] p 76 N84-25525
- COMPILERS**
- The dynamics of software development project management: An integrative systems dynamic perspective
[NASA-CR-175342] p 44 N84-16824
- The evolution of the JOVIAL/J73 language from definition to use
[AD-P003518] p 56 N84-31122
- COMPLEX SYSTEMS**
- Automating the configuration management process
p 38 A84-16633
- The multiobjective multistage impact analysis method
Theoretical basis
p 14 A84-33465
- COMPONENT RELIABILITY**
- Optimum warranty policies for nonreparable items
p 89 A84-15216
- COMPUTATION**
- Future directions in large-scale scientific computing
[DE83-013229] p 40 N84-10807
- NASA-wide standard administrative systems
p 48 N84-21415
- COMPUTER AIDED DESIGN**
- Reducing design prototyping and production cycle times and costs -- in robotic assembly
p 31 A84-17159
- Computer-assisted engineering data base
[ASME PAPER 83-WA/AERO-11] p 32 A84-30608
- Network analysis utilizing computer graphics
p 14 A84-31781
- Computer system design environment software development plan
[AD-A131651] p 41 N84-12747
- CAD/CAM technology working group report IDA/OSD R/M (Institute for Defense Analyses/Office of the Secretary of Defense Research and Maintainability) study
[AD-A137761] p 33 N84-20867
- The database management system: A topic and a tool
p 48 N84-22316
- The role of DBMS in design research
p 34 N84-22317
- Impact of IPAD on CAD/CAM database university research
p 34 N84-22318
- Corporate DP planning: New approaches and new concerns -- data processing (DP)
[PNR-90180] p 50 N84-23386
- Computer developments at Institute of Automation and Electrometry described
p 34 N84-23390
- Experimental design: Review and comment
[AD-A139268] p 19 N84-24309
- Important CAD/CAM utilization at MBB
[MBB-Z-13-83-0] p 35 N84-26451
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[NLR-MP-83044-U] p 53 N84-27482
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- COMPUTER AIDED MANUFACTURING**
- Reducing design prototyping and production cycle times and costs -- in robotic assembly
p 31 A84-17159
- Advances in manufacturing technology
p 31 A84-28014
- Planning the use of robots
p 32 A84-42760
- Introduction to flexible manufacturing systems: Their applications, classification, and opportunities
[DE83-017373] p 33 N84-13868
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[AD-A134249] p 33 N84-16829
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- Manufacturing information system
[AD-A137891] p 33 N84-20730

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[AD-A137761] p 33 N84-20867
- Methodology for benefit analysis of CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) in USN shipyards
[AD-A138398] p 34 N84-22270
- The database management system: A topic and a tool
p 48 N84-22316
- Impact of IPAD on CAD/CAM database university research
p 34 N84-22318
- Corporate DP planning: New approaches and new concerns — data processing (DP)
[PNR-90180] p 50 N84-23386
- Computer developments at Institute of Automation and Electrometry described
p 34 N84-23390
- Saab claims world's most modern engine-assembly plant
p 34 N84-23800
- Important CAD/CAM utilization at MBB
[MBB-Z-13-83-O] p 35 N84-26451
- Computer-automated technological innovation in three manufacturing sectors
[AD-P003309] p 35 N84-28450
- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3, Volume 5: Composite function model of manufacture product (MFG0)
[AD-A142337] p 35 N84-30766
- Integrated Computer-Aided Manufacturing (ICAM) architecture, Part 3, volume 4: Composite information model of design product (DES 1)
[AD-A142447] p 36 N84-30774
- Integrated Computer-Aided Manufacturing (ICAM) architecture, Part 3, Volume 6: Composite information model of "Manufacture product" (MFG1)
[AD-A143072] p 36 N84-31973
- Parts on demand: Evaluation of approaches to achieve flexible manufacturing systems for Navy parts on demand, volume 1
[AD-A143248] p 31 N84-32830
- Academician Vámos interviewed on automation related problems
p 36 N84-34972
- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3, Volume 7: MFG01 glossary
[AD-A144426] p 36 N84-34991
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[AD-A144691] p 37 N84-34999
- COMPUTER ASSISTED INSTRUCTION**
- Individual differences in learning rate
[AD-P003338] p 8 N84-28462
- Video games: A human factors guide to visual display design and instructional system design
[AD-P003369] p 9 N84-28480
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[AD-A142430] p 10 N84-30768
- Ada (registered trademark) training curriculum, Ada (registered trademark) for software managers, L201. Teachers guide: Volume 2
[AD-A142431] p 10 N84-30769
- Training capabilities: The facility part of the equation
[AD-P003457] p 11 N84-32234
- COMPUTER GRAPHICS**
- Network analysis utilizing computer graphics
p 14 A84-31781
- Computer generation of plan of action and milestone schedule
[AD-A137057] p 46 N84-20244
- Manufacturing information system
[AD-A137891] p 33 N84-20730
- Computer-assisted information graphics from the graphic design perspective
[DE84-006059] p 48 N84-22281
- Applications programs to facilitate use of a DBMS to store and retrieve graphics displays (INGRED 2)
[AD-A138059] p 54 N84-28672
- Development of Integrated Programs for Aerospace-vehicle Design (IPAD). IPAD user requirements: Implementation (first-level IPAD)
[NASA-CR-182713] p 30 N84-28776
- A system for embedding data displays in graphical contexts
[AD-A143630] p 24 N84-34191
- COMPUTER INFORMATION SECURITY**
- Security, a set of rules or an approach — cryptography
[NLR-MP-82047-U] p 47 N84-20442
- Information systems, security and privacy
[RAND/P-6930] p 47 N84-21402
- Guidelines for developing NASA (National Aeronautics and Space Administration) ADP security risk management plans
[NASA-CR-173564] p 52 N84-26317
- Guidelines for development of NASA (National Aeronautics and Space Administration) computer security training programs
[NASA-CR-173562] p 52 N84-26318
- Guideline for computer security certification and accreditation. Category: ADP (Automatic Data Processing) operations. Subcategory: Computer security. Federal information processing standards
[FIPS-PUB-102] p 55 N84-30736
- Guidelines for contingency planning NASA (National Aeronautics and Space Administration) ADP security risk reduction decision studies
[PB84-189836] p 55 N84-30737
- COMPUTER NETWORKS**
- Gridnet - An alternative large distributed network
p 39 A84-31351
- INTERACT execute facility for job scheduling and manipulation
[DE84-001653] p 43 N84-14968
- Computer networks without a shared memory
AFOSR-81-0197
[AD-A135074] p 45 N84-17927
- Method for accessing distributed heterogeneous databases
p 47 N84-21412
- The application of management techniques to defence and other information services: The British approach
p 48 N84-21433
- RIM as an implementation tool for a distributed heterogeneous database
p 48 N84-22311
- Special or general purpose end-to-end transport mechanisms in distributed systems: One view
[DE84-008297] p 51 N84-25367
- The database management module of the SPLICE system
[AD-A132795] p 85 N84-28671
- The economics of computerized information dissemination
p 77 N84-28678
- The impact of a computerized network on the quality of work life in two college of advanced education libraries in New South Wales
p 9 N84-29792
- Applying artificial intelligence to large networks
p 36 N84-31743
- The creation of a central database on a microcomputer network
[AD-A143875] p 59 N84-34326
- COMPUTER PROGRAM INTEGRITY**
- Automated interface management for modular software development
p 38 A84-16649
- A methodology for collecting valid software engineering data
[AD-A131332] p 41 N84-11781
- Software quality measurement for distributed systems, volume 1
[AD-A137955] p 92 N84-21128
- Software quality measurement for distributed systems, Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129
- Guidelines for developing NASA (National Aeronautics and Space Administration) ADP security risk management plans
[NASA-CR-173564] p 52 N84-26317
- Guideline for computer security certification and accreditation. Category: ADP (Automatic Data Processing) operations. Subcategory: Computer security. Federal information processing standards
[FIPS-PUB-102] p 55 N84-30736
- Logistic support: A computer manufacturer's viewpoint
[AD-P003496] p 87 N84-32262
- COMPUTER PROGRAMMING**
- Application of software engineering standards - A report on the state of the art
[AIAA PAPER 83-2356] p 88 A84-10026
- Hughes' software engineering procedures improve quality - Do they help productivity?
[AIAA PAPER 83-2357] p 88 A84-10027
- Issues affecting software standards to ensure quality and productivity
[AIAA PAPER 83-2358] p 88 A84-10028
- Implementing software productivity measures
[AIAA PAPER 83-2360] p 66 A84-10029
- Evolution of a source library system — for software engineering
[AIAA PAPER 83-2427] p 37 A84-10062
- Software engineering economics
p 68 A84-24448
- Future directions in large-scale scientific computing
[DE83-013229] p 40 N84-10807
- A methodology for collecting valid software engineering data
[AD-A131332] p 41 N84-11781
- The software engineering environment project model (PROMOD)
p 42 N84-14737
- The project library PLUS: A general overview
p 43 N84-14751
- A host-target programming support environment for the production of high-quality real-time systems
p 43 N84-14753
- ANSI Ada and the UK M-CHAPSE
p 91 N84-14760
- Manual for implementing a Shared Time Engineering Program (STEP) September 1980 through September 1983
[PB84-144260] p 29 N84-21765
- Analyzing program methodologies using software science
[AD-A138121] p 93 N84-22259
- Special or general purpose end-to-end transport mechanisms in distributed systems: One view
[DE84-008297] p 51 N84-25367
- LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 2
[AD-A141397] p 54 N84-29787
- Automated Construction Management System (ACMS). Volume 2: Program documentation
[AD-A143032] p 30 N84-31972
- COMPUTER PROGRAMS**
- Issues affecting software standards to ensure quality and productivity
[AIAA PAPER 83-2358] p 88 A84-10028
- Implementing software productivity measures
[AIAA PAPER 83-2360] p 66 A84-10029
- Forecasting trends in NASA flight software development tools
[AIAA PAPER 83-2334] p 38 A84-10065
- Software configuration management and its contribution to reliability program management
p 89 A84-15217
- Managing test-procedures to achieve reliable software
p 89 A84-15219
- Automating the configuration management process
p 38 A84-16633
- Software development management planning
p 38 A84-24449
- Crisis avoidance in a software management situation
p 38 A84-26710
- Software control and system configuration management - A process that works
p 38 A84-26713
- Avionics software management and control
p 39 A84-26714
- Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text
p 39 A84-44325
- Issues in software maintenance
[AD-A130622] p 40 N84-10786
- Computer system design environment software development plan
[AD-A131651] p 41 N84-12747
- Information retrieval research support
[AD-A131990] p 41 N84-13022
- Formal techniques in the management of software design
[AD-A132569] p 42 N84-13818
- AMIX: An automated system for handling error notification data — amendments on UNIX (trademark); AMIX
p 91 N84-14734
- EDDA: A very high level data flow specification language
p 42 N84-14735
- Software configuration management
p 43 N84-14742
- Ada and the NASA software environment
p 43 N84-14749
- Computer program development specification for Ada integrated environment: KAPSE (Kernel Ada Programming Support Environment)/Database, type b5, B5-AIE(1), KAPSE(1)
[AD-A134092] p 43 N84-14766
- A calculator adaptation of the Markov chain model for manpower analysis
[AD-A132990] p 15 N84-14966
- Microcomputer software system development: Suggested revisions to MIL-STD-1521A for cost-effective acquisition of custom software through software engineering
[AD-A134363] p 44 N84-16830
- Recommended test and evaluation and independent verification and validation actions for the Defense Data Network
[AD-A134167] p 44 N84-17049
- Guidance on software maintenance
[PB84-128951] p 45 N84-18952
- Software Acquisition Resource Expenditure (SARE) data collection methodology
[AD-A137084] p 71 N84-20247
- Applications of operations research and management information system concepts to management of large software projects
p 47 N84-21204
- Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150
- Office automation in the acquisition environment
[AD-P002747] p 49 N84-23294

- A cost based acquisition planning model utilizing expert system concepts
[AD-P002783] p 73 N84-23330
- Computer Generated Acquisition Document System (CGADS)
[AD-P002784] p 50 N84-23331
- Employment changes resulting from the award of contracts in labor surplus areas
[AD-P002834] p 83 N84-23379
- Computer developments at Institute of Automation and Electrometry described p 34 N84-23390
- Development of a proposed standard for the exchange of scientific microcomputer programs
[PB84-157940] p 94 N84-24244
- Software Cost Estimation Workshop report
[AD-A139840] p 51 N84-25354
- PROJUNG FORTRAN: An interactive computer program for use with the defense management simulation exercise
[AD-A140709] p 53 N84-27472
- Interactive risk analysis and development of standardized factors
[AD-A140758] p 77 N84-27473
- Comparing software development methodologies for Ada (trade name): A study plan
[PB84-178029] p 53 N84-27491
- Computer science and technology: Introduction to software packages
[NBS-SP-500-114] p 55 N84-30740
- Configuration management with the Ada (trademark) language
[AD-P003416] p 55 N84-30748
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers guide: Volume 1
[AD-A142430] p 10 N84-30768
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers guide: Volume 2
[AD-A142431] p 10 N84-30769
- Ada (Registered trademark) training curriculum. Software engineering for managers. M101: Teachers guide
[AD-A142432] p 10 N84-30770
- Quality Assurance (QA) procedures for computer software in department 1510
[DE84-012131] p 95 N84-30778
- Software control and system configuration management: A systems-wide approach
[NASA-TM-85908] p 56 N84-31112
- Cost/schedule management for software development
[AD-P003591] p 56 N84-31196
- Software configuration management in a project environment
[AD-P003592] p 57 N84-31197
- An evaluation of the system 2000 data base management system for use in major item system mapping
[DE84-013130] p 87 N84-32296
- Microcomputers in transportation: Software and source book
[PB84-195155] p 87 N84-33067
- A study of the extent of automation in small college libraries and relationships of attitudes of library directors toward it
[DE84-013130] p 87 N84-32296
- Effective organizational solutions for implementation of DBMS software packages p 58 N84-33268
- COMPUTER STORAGE DEVICES**
- Workshop on Magnetic Information Technology (MINT)
[PB84-125210] p 45 N84-18619
- COMPUTER SYSTEMS DESIGN**
- DMS - A system for defining and managing human-computer dialogues p 1 A84-21640
- Computer research in Japan p 39 A84-31347
- A total system design framework p 39 A84-41201
- NU - A network monitoring, control, and management system p 40 A84-49262
- Integrated bid estimate systems for contractors p 70 N84-14699
- Methods for improving the user-computer interface
[AD-A132657] p 2 N84-14713
- Integrated Software Engineering Facilities (ISEF)
[AD-A142430] p 42 N84-14730
- The Integrated Software Engineering Facilities (ISEF) software configuration management system p 42 N84-14732
- ANSI Ada and the UK M-CHAPSE p 91 N84-14760
- Management information system for engineering
[DE84-001655] p 28 N84-14984
- Human engineering guidelines for management information systems. Change 1
[AD-A137808] p 4 N84-21104
- Special or general purpose end-to-end transport mechanisms in distributed systems: One view
[DE84-008297] p 51 N84-25367

- The impact of communicating through computers p 53 N84-27457
- The database management module of the SPLICE system
[AD-A132795] p 85 N84-28671
- Development of Integrated Programs for Aerospace-vehicle Design (IPAD). IPAD user requirements: Implementation (first-level IPAD)
[NASA-CR-162713] p 30 N84-28776
- DBMS conversion case study
[DE84-011205] p 55 N84-31054
- The creation of a central database on a microcomputer network
[AD-A143875] p 59 N84-34326
- COMPUTER SYSTEMS PERFORMANCE**
- A technical overview of the National Software Works
[AD-A132320] p 42 N84-13827
- A guide to macro and micro computer performance evaluation
[AD-A140127] p 51 N84-25329
- Special or general purpose end-to-end transport mechanisms in distributed systems: One view
[DE84-008297] p 51 N84-25367
- Design and performance of a distributed relational data base system
[AD-A142177] p 54 N84-29495
- DBMS conversion case study
[DE84-011205] p 55 N84-31054
- COMPUTER SYSTEMS PROGRAMS**
- The NASA Software Management and Assurance Program
[AIAA PAPER 83-2336] p 37 A84-10015
- Integrated Software Engineering Facilities (ISEF)
[AD-A142430] p 42 N84-14730
- The Integrated Software Engineering Facilities (ISEF) software configuration management system p 42 N84-14732
- AMIX: An automated system for handling error notification data — amendments on UNIX (trademark); AMIX
[AD-A141503] p 91 N84-14734
- EDDA: A very high level data flow specification language p 42 N84-14735
- The software engineering environment project model (PROMOD)
[AD-A142430] p 42 N84-14737
- Software configuration management p 43 N84-14742
- The role of quality assurance in the development of software for space applications p 91 N84-14743
- Functional requirements for the development and use of a software-cost database
[AD-B079998] p 72 N84-22287
- A knowledge-based system for LP (Linear Programming) modeling
[AD-A139991] p 35 N84-25357
- Evaluation of automated configuration management tools in ADA programming support environments
[AD-A140982] p 53 N84-28666
- Local automation model: System specification
[AD-A141503] p 54 N84-29798
- Data base management of software development
[AD-P003486] p 57 N84-32253
- COMPUTER SYSTEMS SIMULATION**
- The simulation of a major Automated Information System (AIS) on a microcomputer
[AD-A143599] p 59 N84-34323
- COMPUTER TECHNIQUES**
- Forecasting trends in NASA flight software development tools
[AIAA PAPER 83-2334] p 38 A84-10065
- Integrated budget control using a desktop computer p 70 N84-14697
- Computerised plant control system p 27 N84-14698
- Integrated bid estimate systems for contractors p 70 N84-14699
- Tendering on a micro computer p 28 N84-14700
- Keeping your fingers crossed won't help p 28 N84-14702
- Computers for the smaller contractors p 28 N84-14703
- Is critical path planning the answer — computer techniques in project management p 15 N84-14705
- Construction planning and control: Current practice and continuing challenges p 28 N84-14706
- INTERACT execute facility for job scheduling and manipulation
[DE84-001653] p 43 N84-14968
- A program for developing automated scientific-information processing in maritime economy
[AD-A135518] p 45 N84-18107
- Manufacturing methods and technology, CAM (Computer Aided Manufacturing) related projects, FY 83-85
[AD-A136572] p 33 N84-18924
- A multi-period repair parts inventory model for a naval air rework facility
[AD-A136873] p 81 N84-19280

- Computer generation of plan of action and milestone schedule
[AD-A137057] p 46 N84-20244
- Knowledge-based support systems for long range planning
[AD-A137311] p 17 N84-20424
- Manufacturing information system
[AD-A137891] p 33 N84-20730
- Use of microcomputers for inventory management with uncertain demand
[DE84-005179] p 81 N84-21112
- Concerted effort for nationwide computer literacy p 4 N84-22357
- Paperless solicitation and contracting
[AD-P002749] p 49 N84-23296
- Consolidation of DOD bidder's mailing list application
[AD-P002752] p 81 N84-23299
- Expert systems for price analysis: A feasibility study
[AD-P002795] p 74 N84-23341
- An intelligent manual for price analysis
[AD-P002798] p 75 N84-23344
- Central Demand Data Base (CDDB) End Item Code (EIC)
[AD-P002807] p 83 N84-23353
- Employment changes resulting from the award of contracts in labor surplus areas p 83 N84-23379
- Important CAD/CAM utilization at MBB
[MBB-Z-13-83-O] p 35 N84-26451
- Microcomputers: Introduction to features and uses
[PB84-178821] p 53 N84-27456
- The impact of communicating through computers p 53 N84-27457
- Assessment of learning abilities using rate measures
[AD-P003340] p 8 N84-28463
- Office automation: A look beyond word processing
[AD-A132764] p 53 N84-28670
- LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 1
[AD-A141396] p 54 N84-29786
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers guide: Volume 2
[AD-A142431] p 10 N84-30769
- Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1)
[AD-A143072] p 36 N84-31973
- The relationship between administrative style and the use of computer-based systems: An attitudinal study of academic library professionals p 11 N84-32276
- Impact of robots and computers on the work force of the 1980's
[GPO-31-912] p 36 N84-32826
- Computer-based measurement of intellectual capabilities p 12 N84-34162
- Managing microcomputers: A survival kit for functional managers
[AD-A144006] p 59 N84-34316
- Report of the Information Technology Workshop
[AD-A144212] p 37 N84-35126
- COMPUTERIZED SIMULATION**
- Building an information model (with the help of PSL/PSA) — Problem Statement Language/Problem Statement Analyzer
[AIAA PAPER 83-2329] p 37 A84-10011
- Airline Maintenance Management System (AMMS) p 79 A84-46582
- Computer simulation of construction operations p 28 N84-14704
- A dynamic personnel assignment model in the R and D environment
[AD-P002765] p 5 N84-23312
- An application of the causal-integrative model
[AD-P002786] p 18 N84-23333
- Employment changes resulting from the award of contracts in labor surplus areas p 83 N84-23379
- Research on factor screening in computer simulation
[AD-A139825] p 20 N84-25353
- Software progress tracking system
[AD-P003488] p 57 N84-32255
- Logistic support: A computer manufacturer's viewpoint
[AD-P003496] p 87 N84-32262
- The simulation of a major Automated Information System (AIS) on a microcomputer
[AD-A143599] p 59 N84-34323
- COMPUTERS**
- Computers for the smaller contractors p 28 N84-14703
- Leadership, managership, and computers in today's Air Force
[AD-P003351] p 22 N84-28468

Comparative analysis of government and private sector ADP acquisition [AD-A144523] p 59 N84-35131

CONDITIONS

Techniques of condition monitoring and fault diagnosis in industry p 27 N84-13595

CONFERENCES

Bottom Line Academia Conference — quality management education [AD-A131043] p 90 N84-11048

Papers for and a summary of a Workshop on The Role of Basic Research in Science and Technology: Case Studies in Energy R and D (Research and Development) [PB83-213637] p 62 N84-11052

Proceedings of the 1982 Integrated Data Users Workshop [DE83-014761] p 40 N84-11066

Management of risk and uncertainty in systems acquisition: Proceedings of the 1983 Defense Risk and Uncertainty Workshop [AD-A136230] p 16 N84-19124

Software Cost Estimation Workshop report [AD-A139840] p 51 N84-25354

Proceedings of the 2nd International Workshop on Statistical Database Management [DE84-005866] p 52 N84-25522

NASA Administrative Data Base Management Systems, 1984 [NASA-CP-2323] p 58 N84-33266

The role of information technology in emergency management [GPO-29-457] p 103 N84-34319

CONFIGURATION MANAGEMENT

Software configuration management and its contribution to reliability program management p 89 A84-15217

Configuration and documentation management — for spacecraft development p 38 A84-15309

Automating the configuration management process p 38 A84-16633

Software control and system configuration management - A process that works p 38 A84-26713

Configuration control methodology for system performance enhancement [AIAA PAPER 84-1942] p 14 A84-43469

Integrated Software Engineering Facilities (ISEF) p 42 N84-14730

The Integrated Software Engineering Facilities (ISEF) software configuration management system p 42 N84-14732

Software configuration management p 43 N84-14742

Coherent management support in the Ada environment p 43 N84-14748

Computer program development specification for Ada integrated environment: KAPSE (Kernel Ada Programming Support Environment)/Database, type b5, B5-AIE(1),KAPSE(1) [AD-A134092] p 43 N84-14766

Benchmarking the selection and projection operations and ordering capabilities of relational database machines [AD-A136776] p 46 N84-20438

An analysis of naval aviation configuration status accounting [AD-A140473] p 84 N84-26460

Evaluation of automated configuration management tools in ADA programming support environments [AD-A140982] p 53 N84-28666

Configuration management with the Ada (trademark) language [AD-P003416] p 55 N84-30748

Software control and system configuration management: A systems-wide approach [NASA-TM-85908] p 56 N84-31112

Software configuration management in a project environment [AD-P003592] p 57 N84-31197

Managing aircraft/simulator concurrency [AD-P003463] p 86 N84-32240

CONGRESSIONAL REPORTS

Space commercialization [GPO-22-870] p 70 N84-10108

Policy and legal issues involved in the commercialization of space [GPO-21-495] p 100 N84-11069

Biological clocks and shift work scheduling [GPO-21-747] p 2 N84-12713

Improving the air traffic control system: An assessment of the National Airspace System Plan p 80 N84-16160

Space commercialization [GPO-26-498] p 71 N84-17194

Joint industry/university cooperation with federally supported research facilities [GPO-24-902] p 100 N84-18115

Role of technology in promoting industrial competitiveness [S-REPT-98-565] p 29 N84-19605

Information systems, security and privacy [RAND/P-6930] p 47 N84-21402

National Aeronautics and Space Administration Authorization Act, 1985 p 101 N84-21443

National Aeronautics and Space Administration Authorization Act, 1985 [H-REPT-98-629] p 101 N84-21444

Transfer of civil meteorological satellites [S-REPT-98-260] p 102 N84-24503

Paperwork Reduction Act of 1980 [S-REPT-98-479] p 102 N84-24504

National Aeronautics and Space Administration Authorization Bill, 1984 [S-REPT-98-455] p 102 N84-24506

Biological clocks and shift work scheduling [GPO-29-312] p 6 N84-25277

The 1985 NASA authorization [GPO-31-453] p 102 N84-25526

Future of aeronautics [GPO-29-744] p 30 N84-25529

Impact of robots and computers on the work force of the 1980's [GPO-31-912] p 36 N84-32826

The role of information technology in emergency management [GPO-29-457] p 103 N84-34319

Commercial Space Launch Act [H-REPT-98-816] p 103 N84-34329

Review of the National Aeronautics and Space Act of 1958, as amended [GPO-38-705] p 103 N84-35134

CONSTRAINTS

The role of DBMS in design research p 34 N84-22317

Research in adaptive control hybrid and constrained structure systems [AD-A140496] p 20 N84-26345

CONSTRUCTION

Microcomputers: A tool for planning and scheduling construction projects [PB83-21201] p 27 N84-11053

Computer simulation of construction operations p 28 N84-14704

CONSTRUCTION INDUSTRY

Information systems design in construction management p 27 N84-14696

Integrated budget control using a desktop computer p 70 N84-14697

Integrated bid estimate systems for contractors p 70 N84-14699

Tendering on a micro computer p 28 N84-14700

Site computers p 28 N84-14701

Keeping your fingers crossed won't help p 28 N84-14702

Computers for the smaller contractors p 28 N84-14703

Construction planning and control: Current practice and continuing challenges p 28 N84-14706

CONSUMERS

Search among queues [AD-A131639] p 70 N84-12773

CONTAMINATION

Priorities for detailed quality assessments of the National Defense Stockpile nonfuel materials [NMAAB-403] p 93 N84-23011

CONTINGENCY

Guidelines for contingency planning NASA (National Aeronautics and Space Administration) ADP security risk reduction decision studies [PB84-189836] p 55 N84-30737

CONTRACT INCENTIVES

Analysis of incentives for productivity-enhancing investment [AD-P002770] p 73 N84-23317

The industrial modernization incentives program: An experimental effort to improve defense contractor productivity [AD-P002771] p 29 N84-23318

Award fee contract provisions as a program management tool [AD-P002776] p 63 N84-23323

Improving the effectiveness of award fee contracts for program management support services [AD-P002827] p 75 N84-23372

Contract requirements: A key to controlling DoD acquisition costs [AD-P002828] p 76 N84-23373

Incentive contracts and cost growth [AD-A140930] p 85 N84-28663

CONTRACT MANAGEMENT

The contract — management for space projects p 60 A84-15304

The establishment of prices and costs p 66 A84-15315

Some technical and contractual aspects of transponder leasing by EUTELSAT p 79 A84-20645

A strategy for improving overhead cost control [AD-A134661] p 71 N84-18092

Multiyear subcontractor selection criteria analysis [AD-A135638] p 80 N84-19126

Q-GERT model of the contracting cycle [AD-A135639] p 16 N84-19127

Mobilization and defense management technical reports series: Management implications of industrial support capabilities for Space Shuttle operations [AD-A137460] p 81 N84-19390

Requirements analysis for forward funding tracking system, volume 1 [AD-A136840] p 46 N84-20425

Requirements analysis for milestone tracking system, volume 2 [AD-A136841] p 46 N84-20426

Mechanized contract document preparation and abstract system [AD-P002750] p 49 N84-23297

Designing the equitable risk contract [AD-P002756] p 81 N84-23303

Assumption of risk in the R and D environment [AD-P002757] p 72 N84-23304

An analysis of the acquisition strategy decision process along three dimensions of the acquisition improvement program [AD-P002758] p 18 N84-23305

Assessing contracting workforce requirements in the matrixed organization [AD-P002760] p 5 N84-23307

Cost accounting standards: A time for government and industry action [AD-P002767] p 72 N84-23314

Government - contractor interaction [AD-P002768] p 63 N84-23315

Needed help for the Federal Acquisition Regulation Council [AD-P002769] p 101 N84-23316

Competitive procurements: The synergistic linkage among government, industry and academe [AD-P002773] p 73 N84-23320

Increasing spares competition in AFLC (Air Force Logistics Center) [AD-P002775] p 81 N84-23322

Award fee contract provisions as a program management tool [AD-P002776] p 63 N84-23323

Nailing down the liability issue once and for all [AD-P002777] p 101 N84-23324

Does the Prompt Payment Act insure timely contract payment? [AD-P002778] p 101 N84-23325

The make or buy decision—its nature and impact [AD-P002779] p 82 N84-23326

Multi-year procurement a 'Team approach' [AD-P002780] p 82 N84-23327

Cost risk and contract type: A normative model [AD-P002781] p 73 N84-23328

Contracting initiative: Best proposal for price [AD-P002782] p 73 N84-23329

A cost based acquisition planning model utilizing expert system concepts [AD-P002783] p 73 N84-23330

An application of the causal-integrative model [AD-P002786] p 18 N84-23333

An automated airframe production cost model [AD-P002787] p 74 N84-23334

Risk analysis: Comparing different contract types [AD-P002788] p 74 N84-23335

Managing for success in defense systems acquisition [AD-P002789] p 64 N84-23336

Contractor 'Hunger' and the relative profitability of DoD business [AD-P002796] p 74 N84-23342

Cost realism: Assuring more realistic contractor cost proposals [AD-P002800] p 75 N84-23346

1982 US Army Materiel Development and Readiness Command (DARCOM) integrated logistic support (ILS) study finding on contracting for ILS [AD-P002805] p 82 N84-23351

Quality at the crossroads [AD-P002818] p 93 N84-23363

Incentives for product quality need contract, cost, production and field co-operation [AD-P002819] p 93 N84-23364

A quality improvement strategy for systems acquisition [AD-P002820] p 94 N84-23365

Engine product performance agreements and the future [AD-P002821] p 94 N84-23366

Improving the effectiveness of award fee contracts for program management support services
[AD-P002827] p 75 N84-23372

Contract requirements: A key to controlling DoD acquisition costs
[AD-P002828] p 76 N84-23373

Material handling: A target for productivity improvement
[AD-P002829] p 83 N84-23374

The impact of factory automation and robotics on the contracting and acquisition processes
[AD-P002830] p 34 N84-23375

A survey of contractor productivity measurement practices
[AD-P002831] p 76 N84-23376

Strengthening small business participation in Department of Defense extramural research and development
[AD-P002832] p 64 N84-23377

Contractor fraud: Government response
[AD-P002833] p 101 N84-23378

Employment changes resulting from the award of contracts in labor surplus areas
[AD-P002834] p 83 N84-23379

Automating the source selection process
[AD-P002835] p 84 N84-23380

Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381

Selection of multiple sources in weapon systems acquisition
[AD-P002837] p 84 N84-23382

PROJING FORTAN: An interactive computer program for use with the defense management simulation exercise
[AD-A140709] p 53 N84-27472

The decision for the optimal price in competitive bidding: The case of a Korean construction company
[AD-A140556] p 65 N84-27585

Contract audit followup: Its impact on defense contracting
[AD-A140627] p 85 N84-27587

Increasing competition for spares within AFLC (Air Force Logistics Command)
[AD-A140751] p 85 N84-27588

Incentive contracts and cost growth
[AD-A140930] p 85 N84-28663

System safety in aircraft acquisition
[AD-A141492] p 95 N84-28763

Effectiveness of multi-year and advance procurement contracts
[AD-P003462] p 86 N84-32239

The Program Planning Review (PPR): Milestone or milestone?
[AD-P003493] p 87 N84-32259

Profit responsibilities in the simulation and training equipment industry
[AD-P003497] p 77 N84-32263

CONTRACT NEGOTIATION

The contract — management for space projects
p 60 A84-15304

The decision for the optimal price in competitive bidding: The case of a Korean construction company
[AD-A140556] p 65 N84-27585

CONTRACTORS

Computers for the smaller contractors
p 28 N84-14703

Government - contractor interaction
[AD-P002768] p 63 N84-23315

Analysis of incentives for productivity-enhancing investment
[AD-P002770] p 73 N84-23317

The industrial modernization incentives program: An experimental effort to improve defense contractor productivity
[AD-P002771] p 29 N84-23318

Strengthening small business participation in Department of Defense extramural research and development
[AD-P002832] p 64 N84-23377

Contractor fraud: Government response
[AD-P002833] p 101 N84-23378

Evaluating the availability, role, and performance of subcontractors in the aerospace industry
[AD-A141408] p 85 N84-29788

CONTRACTS

Management of logistic support costs in the equipment acquisition phase
p 79 A84-15213

The contract — management for space projects
p 60 A84-15304

Cost/schedule controls on major U.S. defense projects
[NASA-TM-85604] p 67 A84-15323

The law applicable to contracts on space activities
[IAF PAPER 82-1SL-39] p 96 A84-17055

Trade agreements on know-how discussed
p 70 N84-10349

Management of aerospace contract documentation by industry and government
[DE84-900451] p 47 N84-21396

Management of aerospace contract documentation by industry and government
p 48 N84-21434

Mechanized contract document preparation and abstract system
[AD-P002750] p 49 N84-23297

Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381

The Score technique: An analytical approach for assessing the results of manufacturing reviews
[AD-P002838] p 30 N84-23383

Contract audit followup: Its impact on defense contracting
[AD-A140627] p 85 N84-27587

Relevant and irrelevant legal structures: Distinguishing private sector from DOD contracting
[AD-P003241] p 102 N84-28408

Cost and schedule control systems criteria for contract performance measurement, information pamphlet
[DE84-012576] p 78 N84-32269

Text processing in the writing of contracts
[SNIAS-84-1422-102] p 65 N84-32297

CONTROL THEORY

Configuration control methodology for system performance enhancement
[AIAA PAPER 84-1942] p 14 A84-43469

The nature and use of formal control systems for management control and strategy implementation
[AD-A139083] p 20 N84-24493

CONTROLLERS

Control systems
[AD-A140901] p 21 N84-27592

CONVENTIONS

The growth of American judicial hostility towards the liability limitations of the Warsaw convention
p 97 A84-20456

The Warsaw Convention - A discussion of the present position
p 99 A84-44854

COOPERATION

A study of temporary task teams — team spirit development in solving complex technical problems or preparing engineering studies
p 2 A84-31212

CORRELATION

Monitoring software development through dynamic variables
p 49 N84-23139

COST ANALYSIS

Implementing software productivity measures
[AIAA PAPER 83-2360] p 66 A84-10029

The establishment of prices and costs
p 66 A84-15315

Cost estimation and estimate analysis — for project planning and management
p 67 A84-15316

The recording of outlays and the projection of completion
p 67 A84-15317

Design to cost — applied to aerospace industry
p 25 A84-15319

The 'Value Analysis' tool
p 67 A84-15320

Cost/schedule controls on major U.S. defense projects
p 67 A84-15323

Scientist discusses problems in introducing new technology
p 62 N84-10357

Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 3
[AD-A131878] p 27 N84-12051

Integrated bid estimate systems for contractors
p 70 N84-14699

Life cycle costing in a dynamic environment
[AD-A133023] p 70 N84-14967

US military aircraft cost handbook
[AD-A136035] p 71 N84-18158

Accuracy of software development activity data: The software cost reduction project
[AD-A137639] p 71 N84-21122

Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150

Cost risk trade-offs in timing the production decision
[AD-P002753] p 29 N84-23300

Managing program risk: One way to reduce cost growth
[AD-P002754] p 72 N84-23301

Risk analysis: Comparing different contract types
[AD-P002788] p 74 N84-23335

The problem of cost growth
[AD-P002792] p 74 N84-23339

Expert systems for price analysis: A feasibility study
[AD-P002795] p 74 N84-23341

An intelligent manual for price analysis
[AD-P002798] p 75 N84-23344

On 'Before' and 'After' cost comparisons
[AD-P002799] p 75 N84-23345

Cost realism: Assuring more realistic contractor cost proposals
[AD-P002800] p 75 N84-23346

Special or general purpose end-to-end transport mechanisms in distributed systems: One view
[DE84-008297] p 51 N84-25367

On a series of problems with machines: Costs of modernization and storage in case of demand
[TUM-M8312] p 30 N84-25863

Interactive risk analysis and development of standardized factors
[AD-A140758] p 77 N84-27473

Comparing software development methodologies for Ada (trade name): A study plan
[PB84-178029] p 53 N84-27491

The design of an expert system for contract price analysis
[AD-A140927] p 77 N84-28662

Incentive contracts and cost growth
[AD-A140930] p 85 N84-28663

Information search in judgment tasks: The effects of unequal cue validity and cost
[AD-A141712] p 23 N84-29437

LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 2
[AD-A141397] p 54 N84-29787

Improving system affordability
[AD-A142387] p 77 N84-31062

Cost/schedule management for software development
[AD-P003591] p 56 N84-31196

A comparison of simulator procurement/program practices: Military versus commercial
[AD-P003453] p 86 N84-32230

Cost and schedule control systems criteria for contract performance measurement, information pamphlet
[DE84-012576] p 78 N84-32269

Worst case performance of some heuristics for lot size problems
[INPE-3134-PRE/525] p 78 N84-34205

COST EFFECTIVENESS

Application of software engineering standards - A report on the state of the art
[AIAA PAPER 83-2356] p 88 A84-10026

Managerial decision-making in establishing R&M design goals
p 89 A84-15211

Optimum warranty policies for nonreparable items
p 89 A84-15216

Productivity improvement in a purchase division: Evaluation of a Performance Contingent Reward System (PCRS)
[AD-A133589] p 71 N84-16801

Microcomputer software system development: Suggested revisions to MIL-STD-1521A for cost-effective acquisition of custom software through software engineering
[AD-A134363] p 44 N84-16830

A strategy for improving overhead cost control
[AD-A134661] p 71 N84-18092

Methodology for benefit analysis of CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) in USN shipyards
[AD-A138398] p 34 N84-22270

Projecting manpower to attain quality
p 5 N84-23148

Consolidation of DOD bidder's mailing list application
[AD-P002752] p 81 N84-23299

An analysis of the acquisition strategy decision process along three dimensions of the acquisition improvement program
[AD-P002758] p 18 N84-23305

Contract requirements: A key to controlling DoD acquisition costs
[AD-P002828] p 76 N84-23373

Problems of prompt adoption of new technology discussed
p 50 N84-23396

The life cycle cost of integrated logistic support
p 85 N84-26962

Environments for evaluating performance of C3I (Command, Control, Communications, and Intelligence) systems
[AD-P003237] p 21 N84-28404

LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 1
[AD-A141396] p 54 N84-29786

Computer science and technology: Introduction to software packages
[NBS-SP-500-114] p 55 N84-30740

Determining cost and training effectiveness tradeoffs for trainer design: Test of an experimental model
[AD-P003455] p 10 N84-32232

Effectiveness of multi-year and advance procurement contracts
[AD-P003462] p 86 N84-32239

Profit responsibilities in the simulation and training equipment industry
[AD-P003497] p 77 N84-32263

COST ESTIMATES

Reliability cost estimation - Managerial perspectives
p 66 A84-15215

- Cost estimation and estimate analysis --- for project planning and management p 67 A84-15316
- The recording of outlays and the projection of completion p 67 A84-15317
- Software engineering economics p 68 A84-24448
- Cost estimation of research and development projects [ASME PAPER 83-WA/MGT-4] p 69 A84-30646
- Integrated bid estimate systems for contractors p 70 N84-14699
- Software Acquisition Resource Expenditure (SARE) data collection methodology p 71 N84-20247
- Statistical models for estimating overhead costs [AD-A137351] p 71 N84-20444
- Functional requirements for the development and use of a software-cost database [AD-B079998] p 72 N84-22287
- Managing program risk: One way to reduce cost growth p 72 N84-23301
- Assumption of risk in the R and D environment [AD-P002757] p 72 N84-23304
- Cost risk and contract type: A normative model [AD-P002781] p 73 N84-23328
- A cost based acquisition planning model utilizing expert system concepts p 73 N84-23330
- An application of the causal-integrative model [AD-P002786] p 18 N84-23333
- An automated airframe production cost model [AD-P002787] p 74 N84-23334
- On 'Before' and 'After' cost comparisons [AD-P002799] p 75 N84-23345
- Cost realism: Assuring more realistic contractor cost proposals p 75 N84-23346
- Software Cost Estimation Workshop report [AD-A139840] p 51 N84-25354
- COST REDUCTION**
- Reducing design prototyping and production cycle times and costs --- in robotic assembly p 31 A84-17159
- An innovative approach to supplier cost control p 69 A84-46348
- Profitability improvement of projects by early consideration of life cycle cost reduction [MBB-UR-620-83-O] p 76 N84-24495
- COSTS**
- Cost accounting standards: A time for government and industry action [AD-P002767] p 72 N84-23314
- Contracting initiative: Best proposal for price [AD-P002782] p 73 N84-23329
- The problem of cost growth [AD-P002792] p 74 N84-23339
- Value and competition [SNIAS-832-501-101] p 76 N84-25504
- CREATIVITY**
- Organizational outcomes of creativity [AD-A132825] p 3 N84-16086
- Training decision-makers to be creative: A management process model [AD-P003347] p 22 N84-28466
- CRITERIA**
- Development and application of a criterion task set for workload metric evaluation [SAE PAPER 831419] p 1 A84-29482
- CRITICAL PATH METHOD**
- Network analysis utilizing computer graphics p 14 A84-31781
- Is critical path planning the answer --- computer techniques in project management p 15 N84-14705
- Estimating critical path and arc probabilities in stochastic activity networks [AD-A134255] p 16 N84-16925
- CRUDE OIL**
- Tactical buying decisions for strategic petroleum reserve spot procurements: The tunnel theory [AD-P002812] p 75 N84-23358
- CRYPTOGRAPHY**
- Security, a set of rules or an approach --- cryptography [NLR-MP-82047-U] p 47 N84-20442
- CUES**
- Equal weights, flat maxima, and trivial decisions [AD-A138506] p 18 N84-22342
- D**
- DAMAGE**
- Research on shock models, wear processes, replacement and maintenance policies [AD-A135620] p 80 N84-19028
- DATA ACQUISITION**
- Information retrieval research support [AD-A131990] p 41 N84-13022
- A set of organizational-climate measures: Internal consistency, factor structure, and predictive power [AD-A135352] p 16 N84-19132
- Software Acquisition Resource Expenditure (SARE) data collection methodology p 71 N84-20247
- Accuracy of software development activity data: The software cost reduction project [AD-A137639] p 71 N84-21122
- Monitoring software development through dynamic variables p 49 N84-23139
- Experimental design: Review and comment [AD-A139268] p 19 N84-24309
- Information search in judgment tasks: The effects of unequal cue validity and cost [AD-A141712] p 23 N84-29437
- Appropriate technology management information system [DE84-010952] p 56 N84-31056
- DATA BASE MANAGEMENT SYSTEMS**
- Computer-assisted engineering data base [ASME PAPER 83-WA/AERO-11] p 32 A84-30608
- Proceedings of the 1982 Integrated Data Users Workshop [DE83-014761] p 40 N84-11066
- Information retrieval research support [AD-A131990] p 41 N84-13022
- Knowledge base management for model management systems [AD-A132211] p 15 N84-14062
- Tools for the creation of IMS database designs from Entity-Relationship diagrams [DE84-000592] p 42 N84-14066
- Benchmarking unstructured systems [DE83-011175] p 15 N84-14969
- ALDS project: Motivation, statistical database management issues, perspectives, and directions [DE84-001412] p 44 N84-14983
- Data organisations and their management p 45 N84-17069
- Universal relation database systems [AD-A135707] p 46 N84-19176
- Software Acquisition Resource Expenditure (SARE) data collection methodology [AD-A137084] p 71 N84-20247
- Requirements analysis for milestone tracking system, volume 2 [AD-A136841] p 46 N84-20426
- Automated RTOP management system p 47 N84-21406
- Automated administrative data bases p 47 N84-21411
- Method for accessing distributed heterogeneous databases p 47 N84-21412
- Managing geometric information with a data base management system p 48 N84-22211
- RIM as an implementation tool for a distributed heterogeneous database p 48 N84-22311
- RIM as the data base management system for a material properties data base p 48 N84-22312
- The database management system: A topic and a tool p 48 N84-22316
- The role of DBMS in design research p 34 N84-22317
- Impact of IPAD on CAD/CAM database industry research p 34 N84-22318
- Development of a proposed standard for the exchange of scientific microcomputer programs [PB84-157940] p 94 N84-24244
- Proceedings of the 2nd International Workshop on Statistical Database Management [DE84-005866] p 52 N84-25522
- Guide to reporting time in the financial information system at ANL [DE84-009356] p 6 N84-25524
- Unified database development program [AD-A140309] p 52 N84-26471
- A data management and presentation tool for engineering and research [NLR-MP-83044-U] p 53 N84-27482
- The database management module of the SPLICE system [AD-A132795] p 85 N84-28671
- Applications programs to facilitate use of a DBMS to store and retrieve graphics displays (INGRED 2) [AD-A138059] p 54 N84-28672
- Success with Data Management 4 at the DOE Pinellas Plant [DE84-008021] p 55 N84-29802
- DBMS conversion case study [DE84-011205] p 55 N84-31054
- Applying artificial intelligence to large networks p 36 N84-31743
- An evaluation of the system 2000 data base management system for use in major item system mapping [DE84-013130] p 67 N84-32296
- NASA Administrative Data Base Management Systems, 1984 [NASA-CP-2323] p 58 N84-33266
- Effective organizational solutions for implementation of DBMS software packages p 58 N84-33268
- The administrative window into the integrated DBMS p 58 N84-33270
- An exploratory analysis of the relationship between media richness and managerial information processing [AD-A143503] p 24 N84-33293
- Sandia National Laboratories administrative data processing systems [DE84-014328] p 59 N84-34202
- DATA BASES**
- Computer program development specification for Ada integrated environment: KAPSE (Kernel Ada Programming Support Environment)/Database, type b5, B5-AIE(1), KAPSE(1) [AD-A134092] p 43 N84-14766
- Guide to the development of a human factors engineering data retrieval system [AD-A136918] p 4 N84-20187
- Action Information Management System (AIMS): A user's view p 47 N84-21405
- NASA-wide standard administrative systems p 48 N84-21415
- Functional requirements for the development and use of a software-cost database [AD-B079998] p 72 N84-22287
- Central Demand Data Base (CDDB) End Item Code (EIC) [AD-P002807] p 83 N84-23353
- Increasing the Contractor/Subcontractor/Vendor bidding lists [AD-P002836] p 84 N84-23381
- Research issues in training device design: The organization of a data base [AD-A140815] p 6 N84-26710
- The design of an expert system for contract price analysis [AD-A140927] p 77 N84-28662
- Design and performance of a distributed relational data base system [AD-A142177] p 54 N84-29495
- Evaluating the availability, role, and performance of subcontractors in the aerospace industry [AD-A141408] p 85 N84-29788
- Data base management of software development [AD-P003486] p 57 N84-32253
- Scientific and technical information transfer: Issues and options [RAND/N-2131-NSF] p 65 N84-33286
- An evaluation of two reliability and maintainability information systems [AD-A143438] p 87 N84-33290
- The creation of a central database on a microcomputer network [AD-A143875] p 59 N84-34326
- DATA CONVERSION ROUTINES**
- Guide to software conversion management [PB84-118314] p 45 N84-18945
- DATA LINKS**
- An exploratory study of the use of an inexpensive cordless telephone as a part of a data communications link --- management information in hospitals [AD-A134228] p 44 N84-16432
- DATA MANAGEMENT**
- Automated interface management for modular software development p 38 A84-16649
- Research in network management techniques for tactical data communications networks [AD-A131357] p 40 N84-11365
- Office automation management guide [AD-A131770] p 41 N84-13012
- The microcomputer in the acquisition environment [AD-P002748] p 49 N84-23295
- Computer Generated Acquisition Document System (CGADS) [AD-P002784] p 50 N84-23331
- A data management and presentation tool for engineering and research [NLR-MP-83044-U] p 53 N84-27482
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers' guide: Volume 1 [AD-A142430] p 10 N84-30768
- Software configuration management in a project environment [AD-P003592] p 57 N84-31197
- Data base management of software development [AD-P003486] p 57 N84-32253

Managing microcomputers: A survival kit for functional managers
[AD-A144006] p 59 N84-34316

DATA PROCESSING

Information resources management plan
[AD-A131964] p 41 N84-13023

Benchmarking unstructured systems
[DE83-011175] p 15 N84-14969

Security, a set of rules or an approach — cryptography
[NLR-MP-82047-U] p 47 N84-20442

Specifications for a federal information processing standard data dictionary system p 93 N84-21414

Office automation in the acquisition environment
[AD-P002747] p 49 N84-23294

Corporate DP planning: New approaches and new concerns — data processing (DP)
[PNR-90180] p 50 N84-23386

Guide to reporting time in the financial information system at ANL
[DE84-009356] p 6 N84-25524

Guidelines for developing NASA (National Aeronautics and Space Administration) ADP security risk management plans
[NASA-CR-173564] p 52 N84-26317

Guidelines for development of NASA (National Aeronautics and Space Administration) computer security training programs
[NASA-CR-173562] p 52 N84-26318

The database management module of the SPLICE system
[AD-A132795] p 85 N84-28671

Design and performance of a distributed relational data base system
[AD-A142177] p 54 N84-29495

Guideline for computer security certification and accreditation. Category: ADP (Automatic Data Processing) operations. Subcategory: Computer security. Federal information processing standards
[FIPS-PUB-102] p 55 N84-30736

Computer science and technology: Introduction to software packages
[NBS-SP-500-114] p 55 N84-30740

Development of a document preparation staff within an office automation environment
[DE84-008649] p 55 N84-31041

Applying artificial intelligence to large networks
p 36 N84-31743

I/O channel interface
[NBS-FIPS-PUB-60-2] p 57 N84-33057

An exploratory analysis of the relationship between media richness and managerial information processing
[AD-A143503] p 24 N84-33293

Comparative analysis of government and private sector ADP acquisition
[AD-A144523] p 59 N84-35131

DATA PROCESSING EQUIPMENT

Design of office information systems
[AD-A136523] p 46 N84-19170

Mechanized contract document preparation and abstract system
[AD-P002750] p 49 N84-23297

Report on U.S. domestic and international telecommunications and information markets
[PB84-166362] p 77 N84-27602

LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 2
[AD-A141397] p 54 N84-29787

DATA RECORDING

Designing readable and reusable tables
[RAND/P-6945] p 51 N84-24496

DATA REDUCTION

ALDS project: Motivation, statistical database management issues, perspectives, and directions
[DE84-001412] p 44 N84-14983

DATA RETRIEVAL

Applications programs to facilitate use of a DBMS to store and retrieve graphics displays (INGRED 2)
[AD-A138059] p 54 N84-28672

Applying artificial intelligence to large networks
p 36 N84-31743

DATA STORAGE

Applications programs to facilitate use of a DBMS to store and retrieve graphics displays (INGRED 2)
[AD-A138059] p 54 N84-28672

DATA SYSTEMS

Forecasting trends in NASA flight software development tools
[AIAA PAPER 83-2334] p 38 A84-10065

Design and performance of a distributed relational data base system
[AD-A142177] p 54 N84-29495

DATA TRANSMISSION

Strategies and mechanisms for the diffusion of scientific and technical information: A comparative study
p 51 N84-23406

Special or general purpose end-to-end transport mechanisms in distributed systems: One view
[DE84-008297] p 51 N84-25367

MITS II (Microfiche Image Transmission System) investigations and design alternatives
[AD-A141040] p 54 N84-28673

DECISION MAKING

Managerial decision-making in establishing R&M design goals
p 89 A84-15211

Risk assessment
p 12 A84-15322

Identifying operative goals by modeling project selection decisions in research and development
p 12 A84-15599

An interactive system for supporting multiobjective decision making
p 13 A84-21643

Modeling and analysis of teams of interacting decisionmakers with bounded rationality
p 13 A84-21644

Engineering tradeoff problems viewed as multiple objective optimizations and the VODCA methodology
p 13 A84-31213

ARIADNE - A knowledge-based interactive system for planning and decision support
p 14 A84-33463

The multiobjective multistage impact analysis method
Theoretical basis
p 14 A84-33465

Motivating managers: A guide to performance targeting and performance-based pay in state and local governments
[PB83-237834] p 14 N84-11978

Search among queues
[AD-A131639] p 70 N84-12773

Information resources management plan
[AD-A131964] p 41 N84-13023

Knowledge base management for model management systems
[AD-A132211] p 15 N84-14062

Project management techniques for highly integrated programs
[NASA-TM-86023] p 63 N84-14965

Multyear subcontractor selection criteria analysis
[AD-A135638] p 80 N84-19126

Q-GERT model of the contracting cycle
[AD-A135639] p 16 N84-19127

Knowledge-based support systems for long range planning
[AD-A137311] p 17 N84-20424

Decision theory: Individual biases and their effect on forecasting in an organization
[AD-A137943] p 17 N84-21395

Societal versus individual decision making: How they might differ
[IZF-1983-20] p 18 N84-22166

Equal weights, flat maxima, and trivial decisions
[AD-A138506] p 18 N84-22342

Cost risk trade-offs in timing the production decision
[AD-P002753] p 29 N84-23300

Managing program risk: One way to reduce cost growth
[AD-P002754] p 72 N84-23301

DECISION TECHNOLOGY: The catalyst for acquisition improvement
[AD-P002755] p 18 N84-23302

Designing the equitable risk contract
[AD-P002756] p 81 N84-23303

Competitive procurements: The synergistic linkage among government, industry and academe
[AD-P002773] p 73 N84-23320

The make or buy decision—its nature and impact
[AD-P002779] p 82 N84-23326

Computer Aided Source Selection (CASS)
[AD-P002785] p 50 N84-23332

An automated airframe production cost model
[AD-P002787] p 74 N84-23334

Expert systems for price analysis: A feasibility study
[AD-P002795] p 74 N84-23341

Program Manager's Support System (PMSS): An update
[AD-P002825] p 50 N84-23370

The Score technique: An analytical approach for assessing the results of manufacturing reviews
[AD-P002838] p 30 N84-23383

Research agenda in non-linear decision systems
[PB84-161207] p 19 N84-24102

Data envelopment analysis and extensions for decision support and management planning
[AD-A139430] p 19 N84-24489

Interactive decision analysis and modelling
[CSIR-TWISK-294] p 20 N84-25403

Decision support for innovation management: Application to the lighting industry
[IIASA-RR-83-29] p 20 N84-25503

Management. A continuing bibliography for NASA managers, with indexes
[NASA-SP-7500(18)] p 20 N84-26429

The impact of communicating through computers
p 53 N84-27457

PROJMNQ FORTRAN: An interactive computer program for use with the defense management simulation exercise
[AD-A140709] p 53 N84-27472

Evaluating organizational change through improved understanding of managerial schemata
p 21 N84-27596

Exploring the interaction of the Vroom/Yetton model and leadership style (LPC) (Least Preferred Coworker) as it predicts performance
[AD-P003247] p 22 N84-28414

Subordinate perceptions of contingent leaders: Do followers accept our theories?
[AD-P003248] p 22 N84-28415

To the wilderness and beyond: The application of a model for transformational change
[AD-P003249] p 22 N84-28416

Prototype development of an information-sharing and decision support system for the manpower personnel and training community
[AD-P003310] p 8 N84-28451

Training decision-makers to be creative: A management process model
[AD-P003347] p 22 N84-28466

The design of an expert system for contract price analysis
[AD-A140927] p 77 N84-28662

Fault management
p 23 N84-30709

Interaction of human cognitive models and computer-based models in supervisory control
[AD-A142677] p 23 N84-30717

Determining cost and training effectiveness tradeoffs for trainer design: Test of an experimental model
[AD-P003455] p 10 N84-32232

Equitable assignment rules
[AD-A142809] p 24 N84-32268

Effective organizational solutions for implementation of DBMS software packages
p 58 N84-33268

An evaluation of two reliability and maintainability information systems
[AD-A143438] p 87 N84-33290

An exploratory analysis of the relationship between media richness and managerial information processing
[AD-A143503] p 24 N84-33293

Worst case performance of some heuristics for lot size problems
[INPE-3134-PRE/525] p 78 N84-34205

The role of information technology in emergency management
[GPO-29-457] p 103 N84-34319

Decision-making process in management automation
p 25 N84-34844

The ESA technological research programs
p 66 N84-34717

DECISION THEORY

Incentive Stackelberg strategies for deterministic multi-stage decision processes
p 13 N84-19141

Analogy in systems management - A theoretical inquiry
p 13 N84-25008

Decision theory: Individual biases and their effect on forecasting in an organization
[AD-A137943] p 17 N84-21395

DECISION TECHNOLOGY: The catalyst for acquisition improvement
[AD-P002755] p 18 N84-23302

Research agenda in non-linear decision systems
[PB84-161207] p 19 N84-24102

Interactive decision analysis and modelling
[CSIR-TWISK-294] p 20 N84-25403

Training decision-makers to be creative: A management process model
[AD-P003347] p 22 N84-28466

Interaction of human cognitive models and computer-based models in supervisory control
[AD-A142677] p 23 N84-30717

DEFENSE COMMUNICATIONS SATELLITE SYSTEM

Automated spacecraft health and status
[AIAA PAPER 84-0685] p 31 A84-25276

DEFENSE INDUSTRY

Planning for reliability growth
[AIAA PAPER 83-2776] p 88 A84-12356

Large firm efficiency, concentration, and profitability in defense markets
[AD-P002810] p 75 N84-23356

Strengthening small business participation in Department of Defense extramural research and development
[AD-P002832] p 64 N84-23377

Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381

Contract audit followup: Its impact on defense contracting
[AD-A140627] p 85 N84-27587

Defense industry attitudes about AF interface standards
report of an electronics industries association survey
[AD-P003570] p 95 N84-31175

DEFENSE PROGRAM
Recommended test and evaluation and independent
verification and validation actions for the Defense Data
Network p 44 N84-17D49
[AD-A134167]
Software Acquisition Resource Expenditure (SARE) data
collection methodology p 71 N84-20247
[AD-A137084]
CAD/CAM technology working group report IDA/OSD
R/M (Institute for Defense Analyses/Office of the
Secretary of Defense Research and Maintainability)
study p 33 N84-20867
[AD-A137761]
Report of the DOD-University forum working group on
engineering and science education p 5 N84-23292
[AD-A138205]
Closing the gap between R and D and application in
academe to better support government and industry
[AD-P002761] p 63 N84-23308
Competition: An integral part of the acquisition
process p 73 N84-23321
[AD-P002774]
Increasing spares competition in AFLC (Air Force
Logistics Center) p 81 N84-23322
[AD-P002775]
Multi-year procurement a 'Team approach'
[AD-P002780] p 82 N84-23327
Managing for success in defense systems acquisition
[AD-P002789] p 64 N84-23336
Impact of corporate resource allocation decisions on
national security objectives: Dissynergism in aerospace
industrial resource planning p 29 N84-23347
[AD-P002801]
Policy initiatives to achieve readiness and support
objectives p 82 N84-23350
[AD-P002804]
1982 US Army Materiel Development and Readiness
Command (DARCOM) integrated logistic support (ILS)
study finding on contracting for ILS p 82 N84-23351
[AD-P002805]
Defense systems acquisition review process: A history
and evaluation p 64 N84-23367
[AD-P002822]
The introduction of uncertainty techniques to the
productivity investment fund p 20 N84-27591
[AD-A140864]
Format requirements for scientific and technical reports
prepared by or for the Department of Defense
[AD-A141758] p 54 N84-29799
Matrix management in DoD: An annotated
bibliography p 24 N84-33253
[AD-A143316]

DEMOGRAPHY
Develop a normative or descriptive model of the
international/domestic civil aviation industry, volume 2
[AD-A131877] p 27 N84-12052

DESIGN ANALYSIS
A total system design framework p 39 A84-41201
Design patents p 100 N84-14985
[PB83-224063]
Experimental design: Review and comment
[AD-A139268] p 19 N84-24309
Research issues in training device design: The
organization of a data base p 6 N84-26710
[AD-A140815]
Development of Integrated Programs for
Aerospace-vehicle Design (IPAD). IPAD user
requirements: Implementation (first-level IPAD)
[NASA-CR-162713] p 30 N84-28776

DESIGN TO COST
Managerial decision-making in establishing R&M design
goals p 89 A84-15211
Design to cost — applied to aerospace industry
p 25 A84-15319
Profitability improvement of projects by early
consideration of life cycle cost reduction
[MBB-UR-620-83-O] p 76 N84-24495

DESYNCHRONIZATION (BIOLOGY)
Biological clocks and shift work scheduling
[GPO-21-747] p 2 N84-12713

DETERIORATION
Priorities for detailed quality assessments of the National
Defense Stockpile nonfuel materials
[NMAB-403] p 93 N84-23011

DEVELOPING NATIONS
The socialist and developing countries: Technology
transfer p 62 N84-11035
Licensing computer software: Basic considerations as
to protection and licensing of computer software and its
implications for developing countries
[PB84-150689] p 101 N84-22295

DICTIONARIES

Specifications for a federal information processing
standard data dictionary system p 93 N84-21414

DIGITAL DATA
Information retrieval research support
[AD-A131990] p 41 N84-13022
Analysis of modern analog and digital communication
channels from a manager's perspective
[AD-A143161] p 57 N84-31494

DIGITAL SYSTEMS
Standards and integrated avionic digital system
architecture p 95 N84-31166
[AD-P003561]
Analysis of modern analog and digital communication
channels from a manager's perspective
[AD-A143161] p 57 N84-31494

DISASTERS
The role of information technology in emergency
management p 103 N84-34319
[GPO-29-457]

DISPLAY DEVICES
Technical and economic analysis of the planned visual
display terminal employment for the Stock Point Logistics
Integrated Communications Environment (SPLICE)
[AD-A133642] p 80 N84-14711
Video games: A human factors guide to visual display
design and instructional system design
[AD-P003368] p 9 N84-28480

DISTRIBUTED PROCESSING
Decentralized resource management for embedded
computers p 37 A84-10048
[AIAA PAPER 83-2405]
Gridnet - An alternative large distributed network
p 39 A84-31351
A technical overview of the National Software Works
[AD-A132320] p 42 N84-13827
Computer networks without a shared memory
AFOSR-81-0197 p 45 N84-17927
[AD-A135074]
Software quality measurement for distributed systems,
volume 1 p 92 N84-21128
[AD-A137955]
Software quality measurement for distributed systems,
Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129
Software quality measurement for distributed systems,
Volume 3: Distributed computing systems. Impact on
software quality p 92 N84-21130
[AD-A137957]
Method for accessing distributed heterogeneous
databases p 47 N84-21412
The acquisition management information system: Friend
or foe? p 50 N84-23298
[AD-P002751]
The ROE file system p 52 N84-26473
[AD-A140497]
NASA Administrative Data Base Management Systems,
1984 p 58 N84-33266
[NASA-CP-2323]

DMSP SATELLITES
Office automation in the acquisition environment
[AD-P002747] p 49 N84-23294

DOCUMENT STORAGE
Progress in improving program and budget information
for Congressional use p 72 N84-22511
[AD-A137491]

DOCUMENTATION
Configuration and documentation management — for
spacecraft development p 38 A84-15309
Preferences on technical report format - Results of a
survey p 39 A84-33153
Report format preferences of technical managers and
nonmanagers p 40 A84-45572
A study of critical factors affecting the development of
performance measures in evaluating bibliographic
information retrieval systems p 41 N84-13030
AMIX: An automated system for handling error
notification data — amendments on UNIX (trademark);
AMIX p 91 N84-14734
The project library PLUS: A general overview
p 43 N84-14751
Designing readable and reusable tables
[RAND/P-6945] p 51 N84-24496
Universal documentation system handbook - an
introduction to the universal documentation system
[AD-A140140] p 52 N84-25742
Automated Construction Management System (ACMS),
Volume 2: Program documentation
[AD-A143032] p 30 N84-31972

DOCUMENTS
The Apollo concept: Electronic document delivery by
satellite p 46 N84-19179
[ESA-SP-1048]
Mechanized contract document preparation and
abstract system p 49 N84-23297
[AD-P002750]

DOMESTIC SATELLITE COMMUNICATIONS SYSTEMS

Risk management - A necessary tool for satellite owners
and users p 69 A84-34770

DRUGS
Role of a space station in pharmaceutical
manufacturing p 25 A84-24632

DYNAMIC PROGRAMMING
A multi-item maintenance center inventory model for
low-demand repairable items p 79 A84-45666

E

EARTH ORBITS

Spinoff, 1984 p 65 N84-33305
[NASA-TM-85596]

EARTH RESOURCES PROGRAM

New opportunities for the private sector in space
technology p 69 A84-49145

ECONOMETRICS

Determining cost and training effectiveness tradeoffs for
trainer design: Test of an experimental model
[AD-P003455] p 10 N84-32232

ECONOMIC ANALYSIS

The industrial just return principle p 25 A84-10399
Commercial communications satellite market and
technology in the 90's p 66 A84-11739
[IAF PAPER 83-86]
Space insurance - Issues and problems p 96 A84-16892

Software engineering economics p 68 A84-24448
Analysis of the influence of the load factor in planning
aircraft transport capacity p 68 A84-25192
The economics of space manufacturing - Some
fundamental propositions p 68 A84-29882
[AAS PAPER 83-243]
Deregulating the airlines: An economic analysis
[PB83-250019] p 100 N84-14070

Technical and economic analysis of the planned visual
display terminal employment for the Stock Point Logistics
Integrated Communications Environment (SPLICE)
[AD-A133642] p 80 N84-14711
Fiscal and monetary policy in a general equilibrium
model p 72 N84-22510
[AD-A138502]
Economic production rate study p 74 N84-23340
[AD-P002793]
Tactical buying decisions for strategic petroleum reserve
spot procurements: The tunnel theory p 75 N84-23358
[AD-P002812]
Incentives for new production discussed p 102 N84-23388

Use of economic mechanisms in managing scientific and
technical progress p 76 N84-23389
Technical and economic indicators for industrial
technological institutes p 76 N84-23392
Now: An initial approach to collection of major material
systems actual costs p 76 N84-25505
[AD-A139845]
Parts on demand: Evaluation of approaches to achieve
flexible manufacturing systems for Navy parts on demand,
volume 1 p 31 N84-32830
[AD-A143248]
The ESA technological research programs p 66 N84-34717

ECONOMIC DEVELOPMENT
Organizational improvements in CEMA scientific,
technical cooperation sought p 62 N84-11039
Review of the National Aeronautics and Space Act of
1958, as amended p 103 N84-35134
[GPO-38-705]

ECONOMIC FACTORS
Financing a solar power satellite project p 68 A84-21482
Risk management - A necessary tool for satellite owners
and users p 69 A84-34770
The technical and economic considerations of bringing
satellite communications to small mobile users p 69 A84-37900

Report on development, installation of industrial
robots p 32 N84-11339
Profitability improvement of projects by early
consideration of life cycle cost reduction
[MBB-UR-620-83-O] p 76 N84-24495
The economics of computerized information
dissemination p 77 N84-28678
Review of the National Aeronautics and Space Act of
1958, as amended p 103 N84-35134
[GPO-38-705]

ECONOMIC IMPACT
Employment changes resulting from the award of
contracts in labor surplus areas p 83 N84-23379
[AD-P002834]
Prerequisites for scientific-technical progress
enumerated p 50 N84-23395

- Impact of robots and computers on the work force of the 1980's
[GPO-31-912] p 36 N84-32826
- ECONOMICS**
- Scientist discusses problems in introducing new technology p 62 N84-10357
- USSR report: Machine tools and metalworking equipment
[JPRS-UMM-84-008] p 34 N84-23913
- The decision for the optimal price in competitive bidding: The case of a Korean construction company
[AD-A140556] p 65 N84-27585
- ECONOMY**
- Measures to step up practical use of scientific work discussed p 26 N84-10350
- Effects of science, technology on structure of production process p 26 N84-10351
- Scientists discuss increased production with fewer workers p 26 N84-10356
- Science in the European Economic Community: A self-assessment and a detailed plan of action
[AD-A139078] p 102 N84-24492
- EDITING ROUTINES (COMPUTERS)**
- Applications programs to facilitate use of a DBMS to store and retrieve graphics displays (INGRED 2)
[AD-A138059] p 54 N84-28672
- EDUCATION**
- Training feedback handbook
[AD-A132565] p 2 N84-14683
- Evaluation results for the interactive video competency recognition system
[AD-A133052] p 2 N84-15796
- Concerted effort for nationwide computer literacy
p 4 N84-22357
- Report of the DOD-University forum working group on engineering and science education
[AD-A138205] p 5 N84-23292
- Closing the gap between R and D and application in academe to better support government and industry
[AD-P002761] p 63 N84-23308
- Training requirements for changing times
[AD-P002764] p 5 N84-23311
- Training acquisition personnel through a local college
[AD-P002766] p 6 N84-23313
- Computer-automated technological innovation in three manufacturing sectors
[AD-P003309] p 35 N84-28450
- Individual differences in learning rate
[AD-P003338] p 8 N84-28462
- Assessment of learning abilities using rate measures
[AD-P003340] p 8 N84-28463
- Evaluation of the HARDMAN comparability methodology for manpower, personnel and training
[NASA-CR-173733] p 9 N84-28485
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers' guide: Volume 1
[AD-A142430] p 10 N84-30768
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers' guide: Volume 2
[AD-A142431] p 10 N84-30769
- Ada (Registered trademark) training curriculum. Software engineering for managers. M101: Teachers guide
[AD-A142432] p 10 N84-30770
- Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1)
[AD-A143072] p 36 N84-31973
- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 7: MFG01 glossary
[AD-A144426] p 36 N84-34991
- EFFECTIVENESS**
- Evaluation results for the interactive video competency recognition system
[AD-A133052] p 2 N84-15796
- Performance appraisal revisited
[AD-A132841] p 3 N84-16059
- EFFICIENCY**
- A normative model of work team effectiveness
[AD-A136398] p 17 N84-20165
- Methodology for benefit analysis of CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) in USN shipyards
[AD-A138398] p 34 N84-22270
- Large firm efficiency, concentration, and profitability in defense markets
[AD-P002810] p 75 N84-23356
- Data envelopment analysis and extensions for decision support and management planning
[AD-A139430] p 19 N84-24489
- ELECTRICAL MEASUREMENT**
- Qualification testing and electrical measurement experience: A manufacturer's view p 96 N84-32705

ELECTRONIC EQUIPMENT

- General Purpose Electronic Test Equipment (GPETE) acquisition considerations for automated calibration
[AD-A133865] p 91 N84-14709

- Improving system affordability p 77 N84-31062
- Commentary on Philips R and D strategy, policies, major efforts p 66 N84-34647

ELECTRONIC EQUIPMENT TESTS

- Reliability programs for nonelectronic designs, volume 1
[AD-A133624] p 91 N84-14529

ELECTRONICS

- Industry official on progress in Soviet robotics program p 35 N84-23915

EMBEDDED COMPUTER SYSTEMS

- Decentralized resource management for embedded computers
[AIAA PAPER 83-2405] p 37 A84-10048
- Japan's next generation of robots p 32 A84-31346
- The evolution of the JOVIAL/J73 language from definition to use
[AD-P003518] p 56 N84-31122
- An integrated approach to a successful embedded computer resource project
[AD-P003574] p 56 N84-31179
- Some management initiatives to improve embedded commercial computer and training device life cycle support
[AD-P003494] p 11 N84-32260

EMERGENCIES

- The national air-space system contingency plan
[GPO-29-457] p 78 A84-10416
- The role of information technology in emergency management
[AD-A135863] p 103 N84-34319

EMPLOYEE RELATIONS

- Conflicts among employees and ways of resolving them
[AD-A135863] p 1 A84-14980
- Toward an interpersonal paradigm for superior-subordinate communication
[AD-A135863] p 17 N84-20166

ENERGY CONSERVATION

- Scenario planning: Energy considerations in the long range urban transportation planning process
[DE84-013590] p 87 N84-33308

ENERGY POLICY

- Appropriate Technology Small Grants Program evaluation, volume 1: Executive summary
[DE84-010675] p 102 N84-31038
- Appropriate Technology Small Grants Program evaluation, volume 2
[DE84-010674] p 102 N84-31039
- Department of Energy's activities to limit distribution of certain unclassified scientific and technical information
[PB84-189158] p 57 N84-32302

ENERGY TECHNOLOGY

- Aerospace technology and commercial nuclear power; Proceedings of the Workshop Conference, Williamsburg, VA, November 18-20, 1981 --- Book p 25 A84-19449
- Papers for and a summary of a Workshop on The Role of Basic Research in Science and Technology: Case Studies in Energy R and D (Research and Development)
[PB83-213637] p 62 N84-11052
- Appropriate Technology Small Grants Program evaluation, volume 1: Executive summary
[DE84-010675] p 102 N84-31038
- Appropriate Technology Small Grants Program evaluation, volume 2
[DE84-010674] p 102 N84-31039

ENGINEERING

- Determination of factors affecting performance and productivity in an engineering/design environment
[AD-A143315] p 11 N84-33252

ENGINEERING DRAWINGS

- The role of DBMS in design research p 34 N84-22317

ENGINEERING MANAGEMENT

- Application of software engineering standards - A report on the state of the art
[AIAA PAPER 83-2356] p 88 A84-10026
- Hughes' software engineering procedures improve quality - Do they help productivity?
[AIAA PAPER 83-2357] p 88 A84-10027
- Managing engineers effectively p 13 A84-15600
- Social-psychological problems in the evaluation of engineering personnel in automated systems for the control of developing enterprises p 1 A84-23706
- Software development management planning p 38 A84-24449
- Software engineering project standards p 90 A84-24450
- Avionics software management and control p 39 A84-26714
- Computer-assisted engineering data base
[ASME PAPER 83-WA/AERO-11] p 32 A84-30608

- A study of temporary task teams --- team spirit development in solving complex technical problems or preparing engineering studies p 2 A84-31212
- Engineering tradeoff problems viewed as multiple objective optimizations and the VODCA methodology p 13 A84-31213

- Needs assessment for support units in an R & D organization p 61 A84-31214
- Evolution in aerospace engineering organisation p 26 A84-32774

- Recommendations for NASA research and development in artificial intelligence p 32 N84-11817

- Management information system for engineering
[DE84-001655] p 28 N84-14984

- Design patents
[PB83-224063] p 100 N84-14985

- An introduction to human factors for engineering managers: Framework for a teaching unit
[AD-A135958] p 4 N84-20428

- Manual for implementing a Shared Time Engineering Program (STEP) September 1980 through September 1983 p 29 N84-21765

- Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150

- ENGINES**
- Engine product performance agreements and the future
[AD-P002821] p 94 N84-23366

- ENVIRONMENTAL TESTS**
- Qualification testing and electrical measurement experience: A manufacturer's view p 96 N84-32705

- ENVIRONMENTS**
- Organizational-climate dimensions: A conceptual and judgmental analysis
[AD-A132898] p 15 N84-16068

- Determination of factors affecting performance and productivity in an engineering/design environment
[AD-A143315] p 11 N84-33252

- EQUIPMENT**
- Management of logistic support costs in the equipment acquisition phase p 79 A84-15213

- ERRORS**
- AMIX: An automated system for handling error notification data --- amendments on UNIX (trademark); AMIX p 91 N84-14734

- ESA SATELLITES**
- Some technical and contractual aspects of transponder leasing by EUTELSAT p 79 A84-20645

- ESTIMATING**
- On 'Before' and 'After' cost comparisons
[AD-P002799] p 75 N84-23345

- Interactive risk analysis and development of standardized factors
[AD-A140758] p 77 N84-27473

- EUROPE**
- Science in the European Economic Community: A self-assessment and a detailed plan of action
[AD-A139078] p 102 N84-24492

- EUROPEAN COMMUNICATIONS SATELLITE**
- The Apollo concept: Electronic document delivery by satellite
[ESA-SP-1048] p 46 N84-19179

- EUROPEAN SPACE AGENCY**
- The industrial just return principle p 25 A84-10399

- Legal status of memoranda of understanding in the United States p 99 A84-38475

- ESA and its programs: Present and future p 66 N84-34716

- The ESA technological research programs p 66 N84-34717

- EUROPEAN SPACE PROGRAMS**
- The workload of European space industry - Current situation and foreseeable trends p 26 A84-38468

- ESA and its programs: Present and future p 66 N84-34716

- The ESA technological research programs p 66 N84-34717

- EVALUATION**
- An evaluation of the effectiveness of project control systems p 61 A84-42621

- Technical and economic indicators for industrial technological institutes p 76 N84-23392

- To the wilderness and beyond: The application of a model for transformational change
[AD-P003249] p 22 N84-28416

- EXERCISE PHYSIOLOGY**
- Physical performance tests as predictors of task performance
[AD-P003257] p 7 N84-28424

- EXPENDABLE STAGES (SPACECRAFT)**
- Federal government regulation of commercial operations using expendable launch vehicles p 99 A84-43365

EXPERIENCE

The role of relevant experience and intellectual ability in determining the performance of military leaders: A contingency model explanation
[AD-P003303] p 22 N84-28448

EXPERIMENT DESIGN

Software quality measurement for distributed systems. Volume 3: Distributed computing systems. Impact on software quality
[AD-A137957] p 92 N84-21130

Experimental design: Review and comment
[AD-A139268] p 19 N84-24309

EXPERT SYSTEMS

Navy AI programs - With emphasis on applications --- Artificial Intelligence
[AIAA PAPER 83-2349] p 31 A84-10022

Automated spacecraft health and status
[AIAA PAPER 84-0685] p 31 A84-25276

ARIADNE - A knowledge-based interactive system for planning and decision support
p 14 A84-33463

A cost based acquisition planning model utilizing expert system concepts
[AD-P002783] p 73 N84-23330

Expert systems for price analysis: A feasibility study
[AD-P002795] p 74 N84-23341

The design of an expert system for contract price analysis
[AD-A140927] p 77 N84-28662

Interaction of human cognitive models and computer-based models in supervisory control
[AD-A142677] p 23 N84-30717

F**FABRICATION**

Introduction to flexible manufacturing systems: Their applications, classification, and opportunities
[DE83-017373] p 33 N84-13868

Manufacturing methods and technology, CAM (Computer Aided Manufacturing) related projects, FY 83-85
[AD-A136572] p 33 N84-18924

FACSIMILE COMMUNICATION

MITS II (Microfiche Image Transmission System) investigations and design alternatives
[AD-A141040] p 54 N84-28673

FACTOR ANALYSIS

Factor stability and construct validation of Yuki's MBS (Managerial Behavior Survey) for military leadership
[AD-P003246] p 21 N84-28413

Psychophysiological tools in engineering psychology
[AD-P003337] p 8 N84-28461

FACTORIAL DESIGN

Experimental design: Review and comment
[AD-A139268] p 19 N84-24309

Research on factor screening in computer simulation
[AD-A139825] p 20 N84-25353

FAILURE

The evolution and practical applications of failure modes and effects analyses
[AD-A131358] p 90 N84-11778

FAILURE ANALYSIS

Automated spacecraft health and status
[AIAA PAPER 84-0685] p 31 A84-25276

The evolution and practical applications of failure modes and effects analyses
[AD-A131358] p 90 N84-11778

The dynamics of software development project management: An integrative systems dynamic perspective
[NASA-CR-175342] p 44 N84-16824

Central Demand Data Base (CDDB) End Item Code (EIC)
[AD-P002807] p 83 N84-23353

Fault management
p 23 N84-30709

FAILURE MODES

The evolution and practical applications of failure modes and effects analyses
[AD-A131358] p 90 N84-11778

FATIGUE (BIOLOGY)

Physical performance tests as predictors of task performance
[AD-P003257] p 7 N84-28424

FAULT TOLERANCE

Gridnet - An alternative large distributed network
p 39 A84-31351

FEASIBILITY ANALYSIS

Space Station commercial user development
[NASA-CR-173688] p 77 N84-27756

FEDERAL BUDGETS

Strengthening the government-university partnership in science
[PB83-230870] p 100 N84-11979

Requirements analysis for forward funding tracking system, volume 1
[AD-A136840] p 46 N84-20425

Progress in improving program and budget information for Congressional use
[AD-A137491] p 72 N84-22511

National Aeronautics and Space Administration Authorization Bill, 1984
[S-REPT-98-455] p 102 N84-24506

The 1985 NASA authorization
[GPO-31-453] p 102 N84-25526

Department of Energy's activities to limit distribution of certain unclassified scientific and technical information
[PB84-189158] p 57 N84-32302

Introduction to the airport improvement program
[AD-A144556] p 103 N84-34454

FEEDBACK

Training feedback handbook
[AD-A132565] p 2 N84-14683

FEEDBACK CONTROL

Incentive Stackelberg strategies for deterministic multi-stage decision processes
p 13 A84-19141

FIBER OPTICS

Communication networks p 58 N84-33356

FIGHTER AIRCRAFT

The 'affordable' fighter market p 68 A84-20599

A strategy for improving overhead cost control
[AD-A134661] p 71 N84-18092

US military aircraft cost handbook
[AD-A136035] p 71 N84-18158

FILE MAINTENANCE (COMPUTERS)

Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text
p 39 A84-44325

The ROE file system
[AD-A140497] p 52 N84-26473

FINANCE

Cost risk trade-offs in timing the production decision
[AD-P002753] p 29 N84-23300

Voluntary accounting systems for a small air carrier: Revenues, financial and traffic statistics
[PB84-210996] p 78 N84-32369

FINANCIAL MANAGEMENT

Financing large space projects p 67 A84-15321

The launch and performance of spacecraft - An insurance perspective
p 97 A84-20646

Financing a solar power satellite project
p 68 A84-21482

Risk management - A necessary tool for satellite owners and users
p 69 A84-34770

Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary
[AD-A131876] p 27 N84-12053

Integrated budget control using a desktop computer
p 70 N84-14697

Computerised plant control system p 27 N84-14698

Tendering on a micro computer p 28 N84-14700

Site computers p 28 N84-14701

Keeping your fingers crossed won't help
p 28 N84-14702

Productivity improvement in a purchase division: Evaluation of a Performance Contingent Reward System (PCRS)
[AD-A133589] p 71 N84-16801

Alternative strategies for space station financing
[NASA-CR-175412] p 72 N84-21437

Functional requirements for the development and use of a software-cost database
[AD-B079998] p 72 N84-22287

Fiscal and monetary policy in a general equilibrium model
[AD-A138502] p 72 N84-22510

Progress in improving program and budget information for Congressional use
[AD-A137491] p 72 N84-22511

Guidelines for development of NASA (National Aeronautics and Space Administration) computer security training programs
[NASA-CR-173562] p 52 N84-26318

National Aeronautics and Space Administration's first-year implementation of the Federal Managers' Financial Integrity Act
[PB84-188770] p 103 N84-31044

Mid-robots get underway in September: Lab-industry link
p 36 N84-34649

FLIGHT CHARACTERISTICS

Assessment of the NASA Flight Assurance Review Program
[NASA-CR-173418] p 94 N84-23401

FLIGHT SAFETY

Airspace management can be improved
p 78 A84-12185

Deregulation and commuter airline safety
p 99 A84-36942

The Aviation Safety Analysis System (ASAS) - An overview
p 90 A84-41079

Assessment of the NASA Flight Assurance Review Program
[NASA-CR-173418] p 94 N84-23401

FLIGHT SIMULATORS

A comparison of simulator procurement/program practices: Military versus commercial
[AD-P003453] p 86 N84-32230

Concurrency of design criteria: A key to trainer readiness
[AD-P003454] p 10 N84-32231

Managing aircraft/simulator concurrency
[AD-P003463] p 86 N84-32240

FLIGHT TESTS

Flight test airspace - A vital part of the plan
[AIAA PAPER 83-2711] p 78 A84-12316

Reliability program development and implementation for a remote piloted vehicle
p 88 A84-15208

FOOD PROCESSING

Workshop on Systems Analysis
[PB84-194661] p 24 N84-33138

FORECASTING

Forecasting trends in NASA flight software development tools
[AIAA PAPER 83-2334] p 38 A84-10065

Future directions in large-scale scientific computing
[DE83-013229] p 40 N84-10807

Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary
[AD-A131876] p 27 N84-12053

FORGING

Productivity and the forging industry
p 28 N84-18448

FORMAT

Preferences on technical report format - Results of a survey
p 39 A84-33153

Report format preferences of technical managers and nonmanagers
p 40 A84-45572

Designing readable and reusable tables
[RAND/P-6945] p 51 N84-24496

FUNCTIONAL DESIGN SPECIFICATIONS

EDDA: A very high level data flow specification language
p 42 N84-14735

G**GAME THEORY**

Incentive Stackelberg strategies for deterministic multi-stage decision processes
p 13 A84-19141

GENERAL AVIATION AIRCRAFT

Competitive assessment of the U.S. Civil aircraft industry
[PB84-154913] p 76 N84-25525

GEOMETRIC RECTIFICATION (IMAGERY)

Managing geometric information with a data base management system
p 48 N84-22211

GEOMETRY

Managing geometric information with a data base management system
p 48 N84-22211

GERT

Computer generation of plan of action and milestone schedule
[AD-A137057] p 46 N84-20244

Computer-assisted information graphics from the graphic design perspective
[DE84-006059] p 48 N84-22281

Designing readable and reusable tables
[RAND/P-6945] p 51 N84-24496

A system for embedding data displays in graphical contexts
[AD-A143630] p 24 N84-34191

GOAL THEORY

Identifying operative goals by modeling project selection decisions in research and development
p 12 A84-15599

An interactive system for supporting multiobjective decision making
p 13 A84-21643

GOALS

An analysis of relationships among size, technology and structure in a contextually limited setting
p 21 N84-27597

GOVERNMENT PROCUREMENT

The aircraft availability model: Conceptual framework and mathematics
[AD-A132827] p 79 N84-14115

Life cycle costing in a dynamic environment
[AD-A133023] p 70 N84-14967

Productivity improvement in a purchase division: Evaluation of a Performance Contingent Reward System (PCRS)
[AD-A133589] p 71 N84-16801

Microcomputer software system development:
Suggested revisions to MIL-STD-1521A for cost-effective acquisition of custom software through software engineering
[AD-A134363] p 44 N84-16830
HQ AFSC selection of a microprocessor development system
[AD-A134930] p 45 N84-17891
US military aircraft cost handbook
[AD-A136035] p 71 N84-18158
Multiyear subcontractor selection criteria analysis
[AD-A135638] p 80 N84-19126
Q-GERT model of the contracting cycle
[AD-A135639] p 16 N84-19127
Software quality measurement for distributed systems. Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129
Software quality measurement for distributed systems. Volume 3: Distributed computing systems. Impact on software quality
[AD-A137957] p 92 N84-21130
Office automation in the acquisition environment
[AD-P002747] p 49 N84-23294
Paperless solicitation and contracting
[AD-P002749] p 49 N84-23296
Mechanized contract document preparation and abstract system
[AD-P002750] p 49 N84-23297
Consolidation of DOD bidder's mailing list application
[AD-P002752] p 81 N84-23299
Cost risk trade-offs in timing the production decision
[AD-P002753] p 29 N84-23300
Managing program risk: One way to reduce cost growth
[AD-P002754] p 72 N84-23301
DECISION TECHNOLOGY: The catalyst for acquisition improvement
[AD-P002755] p 18 N84-23302
Designing the equitable risk contract
[AD-P002756] p 81 N84-23303
Assumption of risk in the R and D environment
[AD-P002757] p 72 N84-23304
An analysis of the acquisition strategy decision process along three dimensions of the acquisition improvement program
[AD-P002758] p 18 N84-23305
Assessing contracting workforce requirements in the matrixed organization
[AD-P002760] p 5 N84-23307
Prerequisites for the establishment of a professional acquisition workforce
[AD-P002763] p 5 N84-23310
Training requirements for changing times
[AD-P002764] p 5 N84-23311
Training acquisition personnel through a local college
[AD-P002766] p 6 N84-23313
Government - contractor interaction
[AD-P002768] p 63 N84-23315
Needed help for the Federal Acquisition Regulation Council
[AD-P002769] p 101 N84-23316
Competitive procurements: The synergistic linkage among government, industry and academe
[AD-P002773] p 73 N84-23320
Competition: An integral part of the acquisition process
[AD-P002774] p 73 N84-23321
Increasing spares competition in AFLC (Air Force Logistics Center)
[AD-P002775] p 81 N84-23322
Award fee contract provisions as a program management tool
[AD-P002776] p 63 N84-23323
Nailing down the liability issue once and for all
[AD-P002777] p 101 N84-23324
Does the Prompt Payment Act insure timely contract payment?
[AD-P002778] p 101 N84-23325
The make or buy decision—its nature and impact
[AD-P002779] p 82 N84-23326
Multi-year procurement a 'Team approach'
[AD-P002780] p 82 N84-23327
Cost risk and contract type: A normative model
[AD-P002781] p 73 N84-23328
Contracting initiative: Best proposal for price
[AD-P002782] p 73 N84-23329
A cost based acquisition planning model utilizing expert system concepts
[AD-P002783] p 73 N84-23330
Computer Generated Acquisition Document System (CGADS)
[AD-P002784] p 50 N84-23331
Computer Aided Source Selection (CASS)
[AD-P002785] p 50 N84-23332
An application of the causal-integrative model
[AD-P002786] p 18 N84-23333

An automated airframe production cost model
[AD-P002787] p 74 N84-23334
Risk analysis: Comparing different contract types
[AD-P002788] p 74 N84-23335
Managing for success in defense systems acquisition
[AD-P002789] p 64 N84-23336
Reshaping the philosophy of spare parts acquisition: Project PACER PRICE
[AD-P002791] p 82 N84-23338
The problem of cost growth
[AD-P002792] p 74 N84-23339
Economic production rate study
[AD-P002793] p 74 N84-23340
Expert systems for price analysis: A feasibility study
[AD-P002795] p 74 N84-23341
Contractor 'Hungriness' and the relative profitability of DoD business
[AD-P002796] p 74 N84-23342
An intelligent manual for price analysis
[AD-P002798] p 75 N84-23344
Cost realism: Assuring more realistic contractor cost proposals
[AD-P002800] p 75 N84-23346
Impact of corporate resource allocation decisions on national security objectives: Dissynergism in aerospace industrial resource planning
[AD-P002801] p 29 N84-23347
Policy initiatives to achieve readiness and support objectives
[AD-P002804] p 82 N84-23350
1982 US Army Materiel Development and Readiness Command (DARCOM) integrated logistic support (ILS) study finding on contracting for ILS
[AD-P002805] p 82 N84-23351
The new MIL-STDs (Military standard) 1388
[AD-P002806] p 82 N84-23352
Project: Acquisition strategy
[AD-P002809] p 83 N84-23355
Tactical buying decisions for strategic petroleum reserve spot procurements: The tunnel theory
[AD-P002812] p 75 N84-23358
Incentives for product quality need contract, cost, production and field co-operation
[AD-P002819] p 93 N84-23364
A quality improvement strategy for systems acquisition
[AD-P002820] p 94 N84-23365
Defense systems acquisition review process: A history and evaluation
[AD-P002822] p 64 N84-23367
A concept for mission-oriented planning for system acquisition at the Defense Communications Agency
[AD-P002823] p 19 N84-23368
Mortality and spareparts: A conceptual analysis
[AD-P002826] p 83 N84-23371
Improving the effectiveness of award fee contracts for program management support services
[AD-P002827] p 75 N84-23372
Contract requirements: A key to controlling DoD acquisition costs
[AD-P002828] p 76 N84-23373
The impact of factory automation and robotics on the contracting and acquisition processes
[AD-P002830] p 34 N84-23375
A survey of contractor productivity measurement practices
[AD-P002831] p 76 N84-23376
Strengthening small business participation in Department of Defense extramural research and development
[AD-P002832] p 64 N84-23377
Employment changes resulting from the award of contracts in labor surplus areas
[AD-P002834] p 83 N84-23379
Automating the source selection process
[AD-P002835] p 84 N84-23380
Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381
Selection of multiple sources in weapon systems acquisition
[AD-P002837] p 84 N84-23382
The Score technique: An analytical approach for assessing the results of manufacturing reviews
[AD-P002838] p 30 N84-23383
Now: An initial approach to collection of major materiel systems actual costs
[AD-A139845] p 76 N84-25505
The 1985 NASA authorization
[GPO-31-453] p 102 N84-25526
Contract audit followup: Its impact on defense contracting
[AD-A140627] p 85 N84-27587
Increasing competition for spares within AFLC (Air Force Logistics Command)
[AD-A140751] p 85 N84-27588

Incentive contracts and cost growth
[AD-A140930] p 85 N84-28663
System safety in aircraft acquisition
[AD-A141492] p 95 N84-28763
LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 1
[AD-A141396] p 54 N84-29786
Improving system affordability
[AD-A142387] p 77 N84-31062
Effectiveness of multi-year and advance procurement contracts
[AD-P003462] p 86 N84-32239
Managing aircraft/simulator concurrency
[AD-P003463] p 86 N84-32240
The Program Planning Review (PPR): Milestone or milestone?
[AD-P003493] p 87 N84-32259
Introduction to the airport improvement program
[AD-A144558] p 103 N84-34454
GOVERNMENT/INDUSTRY RELATIONS
Aviation - The need for uniform legislation
p 96 A84-14048
Should there be a mortgage convention for space activity investors?
[IAF PAPER 82-IISL-52] p 67 A84-17063
Government liability under the Federal Tort Claims Act for negligent inspection and certification of aircraft
p 96 A84-20150
The liability of the United States for negligent inspection
1983 p 97 A84-20454
NTSB procedures — United States National Transportation Safety Board p 98 A84-27416
A legal charter for non-governmental space industrialization
[AAS PAPER 83-225] p 98 A84-29868
Emerging government regulation of American space entrepreneurs
[AAS PAPER 83-227] p 99 A84-29870
International competition in commercial aerospace markets
[AAS PAPER 83-244] p 68 A84-29883
Encouraging business ventures in space technologies
[AAS PAPER 83-246] p 68 A84-29885
Deregulation and commuter airline safety
p 99 A84-36942
Federal government regulation of commercial operations using expendable launch vehicles
p 99 A84-43365
Programs designed to help small businesses commercialize devices invented by NASA, DOD, and other federal agencies - A case history
p 70 A84-49413
Space commercialization
[GPO-22-870] p 70 N84-10108
Lack of support for introduction of Soviet inventions scored
p 62 N84-11042
Sixth all-union congress of inventors held
p 62 N84-11043
Applications of academic research neglected by industry
p 62 N84-11044
Policy and legal issues involved in the commercialization of space
[GPO-21-495] p 100 N84-11069
Deregulating the airlines: An economic analysis
[PB83-250019] p 100 N84-14070
Joint industry/university cooperation with federally supported research facilities
[GPO-24-902] p 100 N84-18115
Closing the gap between R and D and application in academe to better support government and industry
[AD-P002761] p 63 N84-23308
Cost accounting standards: A time for government and industry action
[AD-P002767] p 72 N84-23314
Government - contractor interaction
[AD-P002768] p 63 N84-23315
Needed help for the Federal Acquisition Regulation Council
[AD-P002769] p 101 N84-23316
Analysis of incentives for productivity-enhancing investment
[AD-P002770] p 73 N84-23317
The industrial modernization incentives program: An experimental effort to improve defense contractor productivity
[AD-P002771] p 29 N84-23318
The government relationship to industry in technology transfer and development
[AD-P002772] p 29 N84-23319
Contractor 'Hungriness' and the relative profitability of DoD business
[AD-P002796] p 74 N84-23342
Two-step industrial preparedness planning: Balancing funds and production capability
[AD-P002802] p 29 N84-23348

- Policy initiatives to achieve readiness and support objectives
[AD-P002804] p 82 N84-23350
- Contractor fraud: Government response
[AD-P002833] p 101 N84-23378
- Paperwork Reduction Act of 1980
[S-REPT-98-479] p 102 N84-24504
- Space Station commercial user development
[NASA-CR-173688] p 77 N84-27756
- Proceedings of the 5th Interservice-Industry Training Equipment Conference, volume 2
[AD-A142775] p 11 N84-32266
- GOVERNMENTS**
- Further delineation of the utilization of scientific literature by U.S. patents
[PB84-100734] p 100 N84-18095
- Transfer of civil meteorological satellites
[S-REPT-98-260] p 102 N84-24503
- Department of Energy's activities to limit distribution of certain unclassified scientific and technical information
[PB84-189158] p 57 N84-32302
- Introduction to the airport improvement program
[AD-A144556] p 103 N84-34454
- GRAPH THEORY**
- Fuzzy-network planning - FNET p 12 N84-15220
- Network analysis utilizing computer graphics
[AD-A136983] p 17 N84-20427
- GROUND BASED CONTROL**
- Automated spacecraft health and status
[AIAA PAPER 84-0685] p 31 N84-25276
- Study of the FAA (Federal Aviation Administration) program to modernize maintenance operations
[AD-A142295] p 86 N84-29848
- GROUP DYNAMICS**
- Conflicts among employees and ways of resolving them p 1 N84-14980
- The influence of forms of work organization on personal responsibility in production work p 1 N84-14981
- Organizational-climate dimensions: A conceptual and judgmental analysis
[AD-A132898] p 15 N84-16068
- A set of organizational-climate measures: Internal consistency, factor structure, and predictive power
[AD-A135352] p 16 N84-19132
- A normative model of work team effectiveness
[AD-A136398] p 17 N84-20165
- An intergroup perspective on group dynamics
[AD-A135582] p 17 N84-20167
- Societal versus individual decision making: How they might differ
[IZF-1983-20] p 18 N84-22166
- Subordinate perceptions of contingent leaders: Do followers accept our theories?
[AD-P003248] p 22 N84-28415
- H**
- HANDBOOKS**
- Human factors products: A one-act play with epilogue
[AD-A133354] p 3 N84-16811
- HEART DISEASES**
- Psychological and biochemical effects of a stress management program
[AD-P003300] p 7 N84-28447
- HELICOPTERS**
- An innovative approach to supplier cost control
[AD-A136780] p 69 N84-46348
- HEURISTIC METHODS**
- Decision theory: Individual biases and their effect on forecasting in an organization
[AD-A137943] p 17 N84-21395
- Worst case performance of some heuristics for lot size problems
[INPE-3134-PRE/525] p 78 N84-34205
- HIERARCHIES**
- Incentive Stackelberg strategies for deterministic multi-stage decision processes p 13 N84-19141
- Disjunctive programming and a hierarchy of relaxations for discrete optimization problems
[AD-A132004] p 15 N84-12784
- Optimization methods in hierarchical holographic modeling p 20 N84-26001
- An analysis of relationships among size, technology and structure in a contextually limited setting p 21 N84-27597
- HIGH LEVEL LANGUAGES**
- EDDA: A very high level data flow specification language p 42 N84-14735
- Computer networks without a shared memory
AFOSR-81-0197
[AD-A135074] p 45 N84-17927

- The evolution of the JOVIAL/J73 language from definition to use
[AD-P003518] p 56 N84-31122
- HOLOGRAPHY**
- Optimization methods in hierarchical holographic modeling p 20 N84-26001
- HUBBLE SPACE TELESCOPE**
- Spinoff, 1984
[NASA-TM-85596] p 65 N84-33305
- HUMAN BEHAVIOR**
- The influence of forms of work organization on personal responsibility in production work p 1 N84-14981
- Search among queues
[AD-A131639] p 70 N84-12773
- The human side of robotics: Results from a prototype study on how workers react to a robot
[AD-A133438] p 33 N84-15805
- Toward an interpersonal paradigm for superior-subordinate communication
[AD-A135863] p 17 N84-20166
- An intergroup perspective on group dynamics
[AD-A135582] p 17 N84-20167
- An overview of productivity improvement efforts in Army organizations
[AD-A138589] p 19 N84-24490
- Models of purposive human organization: A comparative study
[AD-A138871] p 19 N84-24491
- Exploring the interaction of the Vroom/Yetton model and leadership style (LPC) (Least Preferred Coworker) as it predicts performance
[AD-P003247] p 22 N84-28414
- Subordinate perceptions of contingent leaders: Do followers accept our theories?
[AD-P003248] p 22 N84-28415
- To the wilderness and beyond: The application of a model for transformational change
[AD-P003249] p 22 N84-28416
- Affective determinants of job perceptions
[AD-P003258] p 7 N84-28425
- Psychological and biochemical effects of a stress management program
[AD-P003300] p 7 N84-28447
- Behavioral issues in the management of technology
[AD-P003349] p 9 N84-28467
- Interactive information environments: A plan for enabling interdisciplinary research
[RAND/N-2115] p 58 N84-33284
- Computer-based measurement of intellectual capabilities
[AD-A144065] p 12 N84-34162
- HUMAN FACTORS ENGINEERING**
- Timely application of advanced human factors test and evaluation techniques during the acquisition of new Air Force systems p 1 N84-19308
- Development and application of a criterion task set for workload metric evaluation
[SAE PAPER 831419] p 1 N84-29482
- Psychology and the study of 'human factors' in management p 2 N84-41555
- Modeling the user in intelligent user interfaces
[DE84-012664] p 2 N84-14795
- Human factors products: A one-act play with epilogue
[AD-A133354] p 3 N84-16811
- GENIE: A computer-based task for experiments in human-computer interaction
[AD-A137473] p 3 N84-20181
- A review of major issues relating to human-machine integration in the development of military systems
[AD-A136739] p 3 N84-20184
- Applied cognitive science
[AD-A136780] p 4 N84-20185
- Guide to the development of a human factors engineering data retrieval system
[AD-A136918] p 4 N84-20187
- An introduction to human factors for engineering managers: Framework for a teaching unit
[AD-A135958] p 4 N84-20428
- Human engineering guidelines for management information systems. Change 1
[AD-A137808] p 4 N84-21104
- Research in man-machine interaction discussed
[AD-A133354] p 6 N84-23393
- Human factors engineering. Part 2: HEDGE (Human factors engineering data guide for evaluation)
[AD-A140391] p 6 N84-26303
- The impact of communicating through computers
[AD-A137473] p 53 N84-27457
- Management information systems: A need for human factors
[AD-P003313] p 8 N84-28452
- The structure of processing resource demands in monitoring automatic systems
[AD-P003319] p 8 N84-28455
- Psychophysiological tools in engineering psychology
[AD-P003337] p 8 N84-28461

- Realization of human work capacity: Interdisciplinary problems p 10 N84-31920
- HUMAN PERFORMANCE**
- Managing engineers effectively p 13 N84-15600
- Organizational correlates of perceived role performance in the research laboratory p 14 N84-42619
- Biological clocks and shift work scheduling
[GPO-21-747] p 2 N84-12713
- Evaluation results for the interactive video competency recognition system
[AD-A133052] p 2 N84-15796
- Performance appraisal revisited
[AD-A132841] p 3 N84-16059
- Organizational outcomes of creativity
[AD-A132825] p 3 N84-16066
- The design of effective reward systems
[AD-A132859] p 3 N84-16067
- Motivation and performance appraisal behavior
[AD-A134311] p 3 N84-17842
- A set of organizational-climate measures: Internal consistency, factor structure, and predictive power
[AD-A135352] p 16 N84-19132
- Personnel technology: Performance appraisal, a process approach
[AD-A138359] p 4 N84-23112
- Social support and performance in complex organizations
[AD-A138888] p 6 N84-24098
- Motivation and work performance: A comparative and analytical study p 6 N84-27441
- To the wilderness and beyond: The application of a model for transformational change
[AD-P003249] p 22 N84-28416
- The role of relevant experience and intellectual ability in determining the performance of military leaders: A contingency model explanation
[AD-P003303] p 22 N84-28448
- Individual differences in learning rate
[AD-P003338] p 8 N84-28462
- A model of inter-organizational influences on organizational processes
[AD-A142450] p 23 N84-31037
- Determination of factors affecting performance and productivity in an engineering/design environment
[AD-A143315] p 11 N84-33252
- Validation of relative-time-spent rating scales
[AD-A144067] p 12 N84-34169
- HUMAN REACTIONS**
- The human side of robotics: Results from a prototype study on how workers react to a robot
[AD-A133438] p 33 N84-15805
- An investigation of organizational climate: Definition, measurement, and usefulness as a diagnostic technique p 21 N84-27595
- HUMAN RELATIONS**
- Organizational structures, processes, and problems: A literature review and taxonomy
[AD-A140979] p 23 N84-28665
- HUMAN RESOURCES**
- Managing creative individuals in high-technology research projects p 1 N84-23990
- A normative model of work team effectiveness
[AD-A136398] p 17 N84-20165
- Report of the DOD-University forum working group on engineering and science education
[AD-A138205] p 5 N84-23292
- Prerequisites for the establishment of a professional acquisition workforce
[AD-P002763] p 5 N84-23310
- Training requirements for changing times
[AD-P002764] p 5 N84-23311
- Validation of relative-time-spent rating scales
[AD-A144067] p 12 N84-34169
- HYBRID STRUCTURES**
- Research in adaptive control hybrid and constrained structure systems
[AD-A140496] p 20 N84-26345
- I**
- IMAGE PROCESSING**
- MITS II (Microfiche Image Transmission System) investigations and design alternatives
[AD-A141040] p 54 N84-28673
- IMAGES**
- MITS II (Microfiche Image Transmission System) investigations and design alternatives
[AD-A141040] p 54 N84-28673
- IMPROVEMENT**
- Introduction to the airport improvement program
[AD-A144556] p 103 N84-34454
- INCENTIVE TECHNIQUES**
- Incentive Stackelberg strategies for deterministic multi-stage decision processes p 13 N84-19141

- The design of effective reward systems
[AD-A132859] p 3 N84-16067
- INCENTIVES**
- Revitalization: An organizational program for the individual
[DE83-014949] p 2 N84-13013
- The design of effective reward systems
[AD-A132859] p 3 N84-16067
- Productivity improvement in a purchase division: Evaluation of a Performance Contingent Reward System (PCRS)
[AD-A133589] p 71 N84-16801
- INDEXES (DOCUMENTATION)**
- SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512
- Master list and index to NASA directives
[NASA-TM-87362] p 59 N84-34321
- INDUSTRIAL MANAGEMENT**
- Significance of allowing for individual differences in organizing the work shift in monotonous production work
p 2 A84-32353
- Programs designed to help small businesses commercialize devices invented by NASA, DOD, and other federal agencies - A case history
p 70 A84-49413
- Techniques of condition monitoring and fault diagnosis in industry
p 27 N84-13595
- Information systems design in construction management
p 27 N84-14696
- Computerised plant control system
p 27 N84-14698
- Productivity improvement in a jobbing shop
p 28 N84-18449
- On the facial structure of scheduling polyhedra
[AD-A136983] p 17 N84-20427
- Cost accounting standards: A time for government and industry action
[AD-P002767] p 72 N84-23314
- The industrial modernization incentives program: An experimental effort to improve defense contractor productivity
[AD-P002771] p 29 N84-23318
- The government relationship to industry in technology transfer and development
[AD-P002772] p 29 N84-23319
- Computer developments at Institute of Automation and Electrometry described
p 34 N84-23390
- Saab claims world's most modern engine-assembly plant
p 34 N84-23800
- Industry official on progress in Soviet robotics program
p 35 N84-23915
- Use of robots in Estonian auto, machine tool industries viewed
p 35 N84-23916
- Robotics impact on labor productivity examined
p 35 N84-24104
- Paperwork Reduction Act of 1980
[S-REPT-98-478] p 102 N84-24504
- Decision-making process in management automation
p 25 N84-34644
- INDUSTRIAL PLANTS**
- Productivity and the forging industry
p 28 N84-18448
- Guide to Canadian aerospace related industries
[AD-A140606] p 30 N84-26650
- Success with Data Management 4 at the DOE Pinellas Plant
[DE84-008021] p 55 N84-29802
- INDUSTRIES**
- Trade agreements on know-how discussed
p 70 N84-10349
- Problems of prompt adoption of new technology discussed
p 50 N84-23396
- INFORMATION**
- Measures to step up practical use of scientific work discussed
p 26 N84-10350
- INFORMATION DISSEMINATION**
- Incentive Stackelberg strategies for deterministic multi-stage decision processes
p 13 A84-19141
- Report format preferences of technical managers and nonmanagers
p 40 A84-45572
- Scientists discuss increased production with fewer workers
p 26 N84-10356
- Data organisations and their management
p 45 N84-17069
- Management of risk and uncertainty in systems acquisition: Proceedings of the 1983 Defense Risk and Uncertainty Workshop
[AD-A136230] p 16 N84-19124
- The Apollo concept: Electronic document delivery by satellite
[ESA-SP-1048] p 46 N84-19179
- Management of aerospace contract documentation by industry and government
[DE84-900451] p 47 N84-21396
- Information systems, security and privacy
[RAND/P-6930] p 47 N84-21402

- Strategies and mechanisms for the diffusion of scientific and technical information: A comparative study
p 51 N84-23406
- The economics of computerized information dissemination
p 77 N84-28678
- Appropriate technology management information system
[DE84-010952] p 56 N84-31056
- Proceedings of the 5th Interservice-Industry Training Equipment Conference, volume 2
[AD-A142775] p 11 N84-32266
- Technology transfer revisited
[DE84-012233] p 65 N84-32293
- Department of Energy's activities to limit distribution of certain unclassified scientific and technical information
[PB84-189158] p 57 N84-32302
- INFORMATION FLOW**
- Strategies and mechanisms for the diffusion of scientific and technical information: A comparative study
p 51 N84-23406
- Technology transfer
[H-REPT-98-15] p 65 N84-25528
- Universal documentation system handbook - an introduction to the universal documentation system
[AD-A140140] p 52 N84-25742
- Interactive information environments: A plan for enabling interdisciplinary research
[RAND/N-2115] p 58 N84-33284
- The role of information technology in emergency management
[GPO-29-457] p 103 N84-34319
- INFORMATION MANAGEMENT**
- Modeling and analysis of teams of interacting decisionmakers with bounded rationality
p 13 A84-21644
- Computer-assisted engineering data base
[ASME PAPER 83-WA/AERO-11] p 32 A84-30608
- ARIADNE - A knowledge-based interactive system for planning and decision support
p 14 A84-33463
- Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text
p 39 A84-44325
- The function of report components in the screening and reading of technical reports
p 40 A84-45547
- A study of critical factors affecting the development of performance measures in evaluating bibliographic information retrieval systems
p 41 N84-13030
- Information systems, security and privacy
[RAND/P-6930] p 47 N84-21402
- Action Information Management System (AIMS): A user's view
p 47 N84-21405
- Automated RTOP management system
p 47 N84-21406
- Method for accessing distributed heterogeneous databases
p 47 N84-21412
- Specifications for a federal information processing standard data dictionary system
p 93 N84-21414
- RIM as an implementation tool for a distributed heterogeneous database
p 48 N84-22311
- RIM as the data base management system for a material properties data base
p 48 N84-22312
- The database management system: A topic and a tool
p 48 N84-22316
- Strategies and mechanisms for the diffusion of scientific and technical information: A comparative study
p 51 N84-23406
- Development of a proposed standard for the exchange of scientific microcomputer programs
[PB84-157940] p 94 N84-24244
- Technology transfer
[H-REPT-98-15] p 65 N84-25528
- Universal documentation system handbook - an introduction to the universal documentation system
[AD-A140140] p 52 N84-25742
- The design of an expert system for contract price analysis
[AD-A140927] p 77 N84-28662
- Applications programs to facilitate use of a DBMS to store and retrieve graphics displays (INGRED 2)
[AD-A138059] p 54 N84-28672
- Development of Integrated Programs for Aerospace-vehicle Design (IPAD). IPAD user requirements: Implementation (first-level IPAD)
[NASA-CR-162713] p 30 N84-28776
- The Optical Coincidence Information Retrieval system (OCIR)
[MPAE-L-66-84-10] p 56 N84-31059
- Department of Energy's activities to limit distribution of certain unclassified scientific and technical information
[PB84-189158] p 57 N84-32302
- The administrative window into the integrated DBMS
p 58 N84-33270
- Interactive information environments: A plan for enabling interdisciplinary research
[RAND/N-2115] p 58 N84-33284

- Sandia National Laboratories administrative data processing systems
[DE84-014328] p 59 N84-34202
- Difficulties of scientific and technological planning
[INPE-2786-PRE/352] p 24 N84-34308
- INFORMATION RETRIEVAL**
- Artificial intelligence implications for information retrieval
[AD-A131382] p 32 N84-11821
- Information retrieval research support
[AD-A131990] p 41 N84-13022
- A study of critical factors affecting the development of performance measures in evaluating bibliographic information retrieval systems
p 41 N84-13030
- Workshop on Magnetic Information Technology (MINT)
[PB84-125210] p 45 N84-18619
- Universal relation database systems
[AD-A135707] p 46 N84-19176
- Guide to the development of a human factors engineering data retrieval system
[AD-A136918] p 4 N84-20187
- Applications of operations research and management information system concepts to management of large software projects
p 47 N84-21204
- Managing geometric information with a data base management system
p 48 N84-22211
- RIM as the data base management system for a material properties data base
p 48 N84-22312
- SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512
- Information search in judgment tasks: The effects of unequal cue validity and cost
[AD-A141712] p 23 N84-29437
- The Optical Coincidence Information Retrieval system (OCIR)
[MPAE-L-66-84-10] p 56 N84-31059
- An evaluation of two reliability and maintainability information systems
[AD-A143438] p 87 N84-33290
- INFORMATION SYSTEMS**
- Building an information model (with the help of PSL/PSA) - Problem Statement Language/Problem Statement Analyzer
[AIAA PAPER 83-2329] p 37 A84-10011
- The Aviation Safety Analysis System (ASAS) - An overview
p 90 A84-41079
- Proceedings of the 1982 Integrated Data Users Workshop
[DE83-014761] p 40 N84-11066
- Information resources management plan
[AD-A131964] p 41 N84-13023
- Information systems design in construction management
p 27 N84-14696
- Design of office information systems
[AD-A136523] p 46 N84-19170
- Guide to the development of a human factors engineering data retrieval system
[AD-A136918] p 4 N84-20187
- The application of management techniques to defence and other information services: The British approach
p 48 N84-21433
- Management of aerospace contract documentation by industry and government
p 48 N84-21434
- Concerted effort for nationwide computer literacy
p 4 N84-22357
- The microcomputer in the acquisition environment
[AD-P002748] p 49 N84-23295
- Report on U.S. domestic and international telecommunications and information markets
[PB84-166362] p 77 N84-27602
- Local automation model: System specification
[AD-A141503] p 54 N84-29798
- Guidelines for contingency planning NASA (National Aeronautics and Space Administration) ADP security risk reduction decision studies
[PB84-189836] p 55 N84-30737
- Appropriate technology management information system
[DE84-010952] p 56 N84-31056
- The Optical Coincidence Information Retrieval system (OCIR)
[MPAE-L-66-84-10] p 56 N84-31059
- The role of information technology in emergency management
[GPO-29-457] p 103 N84-34319
- The simulation of a major Automated Information System (AIS) on a microcomputer
[AD-A143599] p 59 N84-34323
- Report of the Information Technology Workshop
[AD-A144212] p 37 N84-35126
- Comparative analysis of government and private sector ADP acquisition
[AD-A144523] p 59 N84-35131

INFORMATION THEORY

- The determination of user information requirements during the development of management information systems
[AD-A132998] p 43 N84-14980
- Strategies and mechanisms for the diffusion of scientific and technical information: A comparative study
p 51 N84-23406
- A study of the extent of automation in small college libraries and relationships of attitudes of library directors toward it
p 58 N84-33260

INFORMATION TRANSFER

- Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text
p 39 A84-44325
- Strengthening small business participation in Department of Defense extramural research and development
[AD-P002832] p 64 N84-23377
- An exploratory analysis of the relationship between media richness and managerial information processing
[AD-A143503] p 24 N84-33293

INPUT/OUTPUT ROUTINES

- Important CAD/CAM utilization at MBB
[MBB-Z-13-83-O] p 35 N84-26451
- I/O channel interface
[NBS-FIPS-PUB-60-2] p 57 N84-33057

INSTRUCTORS

- Concurrency of design criteria: A key to trainer readiness
[AD-P003454] p 10 N84-32231

INTEGRATED ENERGY SYSTEMS

- Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1)
[AD-A143072] p 36 N84-31973

INTELLIGENCE

- The role of relevant experience and intellectual ability in determining the performance of military leaders: A contingency model explanation
[AD-P003303] p 22 N84-28448
- Age effects on active duty Army MMPI (Minnesota Multiphasic Personality Inventory) profiles
[AD-P003343] p 9 N84-28464

INTELSAT SATELLITES

- Reliability programs for commercial communication satellites
p 88 A84-15209

INTERACTIVE CONTROL

- An interactive system for supporting multiobjective decision making
p 13 A84-21643
- Modeling and analysis of teams of interacting decisionmakers with bounded rationality
p 13 A84-21644
- ARIADNE - A knowledge-based interactive system for planning and decision support
p 14 A84-33463
- GENIE: A computer-based task for experiments in human-computer interaction
[AD-A137473] p 3 N84-20181

INTERFACES

- Automated interface management for modular software development
p 38 A84-16649
- General Purpose Electronic Test Equipment (GPETE) acquisition considerations for automated calibration
[AD-A133865] p 91 N84-14709
- Modeling the user in intelligent user interfaces
[DE84-012664] p 2 N84-14795
- Defense industry attitudes about AF interface standards report of an electronics industries association survey
[AD-P003570] p 95 N84-31175
- I/O channel interface
[NBS-FIPS-PUB-60-2] p 57 N84-33057

INTERNATIONAL COOPERATION

- The industrial just return principle
p 25 A84-10399
- Financing a solar power satellite project
p 68 A84-21482
- Engineering aspects of international cooperation in aeronautics
p 26 A84-44927
- The socialist and developing countries: Technology transfer
p 62 N84-11035
- Organizational improvements in CEMA scientific, technical cooperation sought
p 62 N84-11039
- Project management in the 80's
[MBB-UR-631-83-Q] p 65 N84-26454
- Workshop on Systems Analysis
[PB84-194661] p 24 N84-33138
- Review of the National Aeronautics and Space Act of 1958, as amended
[GPO-38-705] p 103 N84-35134

INTERNATIONAL LAW

- The law applicable to contracts on space activities
[IAF PAPER 82-ISL-39] p 96 A84-17055
- Impact of current U.S. policy on international civil aviation
p 97 A84-20675
- Legal status of memoranda of understanding in the United States
p 99 A84-38475

INTERNATIONAL TRADE

- Science in the European Economic Community: A self-assessment and a detailed plan of action
[AD-A139078] p 102 N84-24492

INTERPROCESSOR COMMUNICATION

- The ROE file system
[AD-A140497] p 52 N84-26473

INVENTIONS

- Lack of support for introduction of Soviet inventions scored
p 62 N84-11042
- Sixth all-union congress of inventors held
p 62 N84-11043

INVENTORIES

- Central Demand Data Base (CDDB) End Item Code (EIC)
[AD-P002807] p 83 N84-23353

INVENTORY CONTROLS

- AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition
[AD-A144045] p 87 N84-33366

INVENTORY MANAGEMENT

- A multi-item maintenance center inventory model for low-demand repairable items
p 79 A84-45666
- The aircraft availability model: Conceptual framework and mathematics
[AD-A132927] p 79 N84-14115
- Use of microcomputers for inventory management with uncertain demand
[DE84-005179] p 81 N84-21112
- Mortality and spareparts: A conceptual analysis
[AD-P002826] p 83 N84-23371
- Transfer of civil meteorological satellites
[S-REPT-98-260] p 102 N84-24503
- The database management module of the SPLICE system
[AD-A132795] p 85 N84-28671
- An evaluation of the system 2000 data base management system for use in major item system mapping
[DE84-013130] p 87 N84-32296

INVESTMENTS

- Analysis of incentives for productivity-enhancing investment
[AD-P002770] p 73 N84-23317
- The introduction of uncertainty techniques to the productivity investment fund
[AD-A140864] p 20 N84-27591

IPAD

- Impact of IPAD on CAD/CAM database university research
p 34 N84-22318
- Development of Integrated Programs for Aerospace-vehicle Design (IPAD). IPAD user requirements: Implementation (first-level IPAD)
[NASA-CR-162713] p 30 N84-28776

J**JAPAN**

- Aircraft accident investigation procedures in Japan
p 98 A84-27410

JUDGMENTS

- The growth of American judicial hostility towards the liability limitations of the Warsaw convention
p 97 A84-20456
- Personnel technology: Performance appraisal, a process approach
[AD-A138359] p 4 N84-23112
- Interactive decision analysis and modelling
[CSIR-TWISK-294] p 20 N84-25403
- Information search in judgment tasks: The effects of unequal cue validity and cost
[AD-A141712] p 23 N84-29437

K**KNOWLEDGE**

- Knowledge-based support systems for long range planning
[AD-A137311] p 17 N84-20424

L**LABOR**

- Employment changes resulting from the award of contracts in labor surplus areas
[AD-P002834] p 83 N84-23379
- Robotics impact on labor productivity examined
p 35 N84-24104
- Biological clocks and shift work scheduling
[GPO-29-312] p 6 N84-25277

LANDSAT SATELLITES

- New opportunities for the private sector in space technology
p 69 A84-49145

LAPLACE TRANSFORMATION

- An approach to logistic problems by the L-transform method
p 80 N84-15884

LASER APPLICATIONS

- ESA and its programs: Present and future
p 66 N84-34716

LAUNCH VEHICLES

- Space commercialization
[GPO-26-498] p 71 N84-17194

LAW (JURISPRUDENCE)

- Policy and legal issues involved in the commercialization of space
[GPO-21-495] p 100 N84-11069
- Relevant and irrelevant legal structures: Distinguishing private sector from DOD contracting
[AD-P003241] p 102 N84-28408

LEADERSHIP

- Toward an interpersonal paradigm for superior-subordinate communication
[AD-A135863] p 17 N84-20166
- Factor stability and construct validation of Yukli's MBS (Managerial Behavior Survey) for military leadership
[AD-P003246] p 21 N84-28413
- Subordinate perceptions of contingent leaders: Do followers accept our theories?
[AD-P003248] p 22 N84-28415
- To the wilderness and beyond: The application of a model for transformational change
[AD-P003249] p 22 N84-28416
- The role of relevant experience and intellectual ability in determining the performance of military leaders: A contingency model explanation
[AD-P003303] p 22 N84-28448
- Leadership, managership, and computers in today's Air Force
[AD-P003351] p 22 N84-28468
- Research integration: An essential for Department of Defense psychological research
[AD-P003366] p 65 N84-28479
- A model of inter-organizational influences on organizational processes
[AD-A142450] p 23 N84-31037
- Determination of factors affecting performance and productivity in an engineering/design environment
[AD-A143315] p 11 N84-33252

LEARNING

- Individual differences in learning rate
[AD-P003338] p 8 N84-28462
- Assessment of learning abilities using rate measures
[AD-P003340] p 8 N84-28463
- An exploratory analysis of the relationship between media richness and managerial information processing
[AD-A143503] p 24 N84-33293

LEASING

- Some technical and contractual aspects of transponder leasing by EUTELSAT
p 79 A84-20645

LEGAL LIABILITY

- Product liability in aviation and its insurability
p 96 A84-11311
- Aviation - The need for uniform legislation
p 96 A84-14048
- Government liability under the Federal Tort Claims Act for negligent inspection and certification of aircraft
p 96 A84-20150
- The liability of the United States for negligent inspection 1983
p 97 A84-20454
- The growth of American judicial hostility towards the liability limitations of the Warsaw convention
p 97 A84-20456
- The launch and performance of spacecraft - An insurance perspective
p 97 A84-20646
- Airworthiness directives - Recovering the cost of compliance
p 97 A84-25032
- Air carrier liability under deregulation
p 97 A84-25033
- The Warsaw Convention - A discussion of the present position
p 99 A84-44854
- Trade agreements on know-how discussed
p 70 N84-10349
- Nailing down the liability issue once and for all
[AD-P002777] p 101 N84-23324
- Contractor fraud: Government response
[AD-P002833] p 101 N84-23378

LIBRARIES

- The project library PLUS: A general overview
p 43 N84-14751
- The application of management techniques to defence and other information services: The British approach
p 48 N84-21433
- SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512
- The impact of a computerized network on the quality of work life in two college of advanced education libraries in New South Wales
p 9 N84-29792
- Local automation model: System specification
[AD-A141503] p 54 N84-29798

The relationship between administrative style and the use of computer-based systems: An attitudinal study of academic library professionals p 11 N84-32276

A study of the extent of automation in small college libraries and relationships of attitudes of library directors toward it p 58 N84-33260

LICENSING

Licensing computer software: Basic considerations as to protection and licensing of computer software and its implications for developing countries [PB84-150689] p 101 N84-22295

LIFE (DURABILITY)

Mortality and spareparts: A conceptual analysis [AD-P002826] p 83 N84-23371

A guide to macro and micro computer performance evaluation [AD-A140127] p 51 N84-25329

Some management initiatives to improve embedded commercial computer and training device life cycle support [AD-P003494] p 11 N84-32260

LIFE CYCLE COSTS

Management of logistic support costs in the equipment acquisition phase p 79 A84-15213

Reliability cost estimation - Managerial perspectives p 66 A84-15215

Life cycle costing in a dynamic environment [AD-A133023] p 70 N84-14967

A cost based acquisition planning model utilizing expert system concepts [AD-P002783] p 73 N84-23330

Profitability improvement of projects by early consideration of life cycle cost reduction [MBB-UR-620-83-O] p 76 N84-24495

The life cycle cost of integrated logistic support p 85 N84-26962

Improving system affordability [AD-A142387] p 77 N84-31062

A comparison of simulator procurement/program practices: Military versus commercial [AD-P003453] p 86 N84-32230

LIGHTING EQUIPMENT

Decision support for innovation management: Application to the lighting industry [IIASA-RR-83-29] p 20 N84-25503

LINEAR PROGRAMMING

Disjunctive programming and a hierarchy of relaxations for discrete optimization problems [AD-A132004] p 15 N84-12784

A knowledge-based system for LP (Linear Programming) modeling [AD-A139991] p 35 N84-25357

LOGICAL ELEMENTS

Interactive decision analysis and modelling [CSIR-TWISK-294] p 20 N84-25403

LOGISTICS

An approach to logistic problems by the L-transform method p 80 N84-15884

Productivity improvement in a jobbing shop p 28 N84-18449

Mobilization and defense management technical reports series. Management implications of industrial support capabilities for Space Shuttle operations [AD-A137460] p 81 N84-19390

Increasing spares competition in AFLC (Air Force Logistics Center) [AD-P002775] p 81 N84-23322

Policy initiatives to achieve readiness and support objectives [AD-P002804] p 82 N84-23350

The new MIL-STDs (Military standard) 1388 [AD-P002806] p 82 N84-23352

The life cycle cost of integrated logistic support p 85 N84-26962

The database management module of the SPLICE system [AD-A132795] p 85 N84-28671

LOGISTICS MANAGEMENT

Integrated logistic supportability (Aviation materiel) [AD-A132367] p 79 N84-13146

Technical and economic analysis of the planned visual display terminal employment for the Stock Point Logistics Integrated Communications Environment (SPLICE) [AD-A133642] p 80 N84-14711

An approach to logistic problems by the L-transform method p 80 N84-15884

An approach to the design of a management information system: Development procedure for the Indonesian defense logistics staff [AD-A134974] p 80 N84-18108

Automated storage and retrieval systems—a consolidation of guidance for project management and implementation [AD-A135571] p 80 N84-19175

A multi-period repair parts inventory model for a naval air rework facility [AD-A136873] p 81 N84-19280

Consolidation of DOD bidder's mailing list application [AD-P002752] p 81 N84-23299

1982 US Army Materiel Development and Readiness Command (DARCOM) integrated logistic support (ILS) study finding on contracting for ILS [AD-P002805] p 82 N84-23351

Central Demand Data Base (CDDB) End Item Code (EIC) [AD-P002807] p 83 N84-23353

Improved management of support resources [AD-P002808] p 83 N84-23354

Quality assurance - Air Force Logistics Command [AD-P002816] p 93 N84-23361

A development of logistics management models for the Space Transportation System [NASA-CR-173504] p 84 N84-23664

Naval aviation IMA repair capability: A readiness to resources approach [AD-A140465] p 84 N84-25612

An analysis of naval aviation configuration status accounting [AD-A140473] p 84 N84-26460

AN/TPN-19 improvements program management plan [AD-A140728] p 84 N84-26690

Increasing competition for spares within AFLC (Air Force Logistics Command) [AD-A140751] p 85 N84-27588

Space Station commercial user development [NASA-CR-173688] p 77 N84-27756

Concurrency of design criteria: A key to trainer readiness [AD-P003454] p 10 N84-32231

Parts on demand: Evaluation of approaches to achieve flexible manufacturing systems for Navy parts on demand, volume 1 [AD-A143248] p 31 N84-32830

The 'affordable' fighter market p 68 A84-20599

LOW GRAVITY MANUFACTURING

Commercialization of opportunities for materials processing in low gravity [NASA-CR-170953] p 71 N84-15165

LUNAR ENVIRONMENT

Profitability of manufacturing in space in view of lunar industrial development and geo-socio-economic benefits p 25 A84-22344

LUNAR SURFACE

Profitability of manufacturing in space in view of lunar industrial development and geo-socio-economic benefits p 25 A84-22344

M**MACHINE TOOLS**

Productivity and the forging industry p 28 N84-18448

USSR report: Machine tools and metalworking equipment [JPRS-UMM-84-008] p 34 N84-23913

Industry urged to increase output of NC machine tool, robotics p 35 N84-23914

Use of robots in Estonian auto, machine tool industries viewed p 35 N84-23916

MAGNETIC STORAGE

Workshop on Magnetic Information Technology (MINT) [PB84-125210] p 45 N84-18619

MAINTAINABILITY

Managerial decision-making in establishing R&M design goals p 89 A84-15211

Reliability cost estimation - Managerial perspectives p 66 A84-15215

Artificial intelligence applications to maintenance technology working group report IDA/OSD R and M (Institute for Defense Analyses/Office of the Secretary of Defense Reliability and Maintainability) study [AD-A137329] p 33 N84-19827

CAD/CAM technology working group report IDA/OSD R/M (Institute for Defense Analyses/Office of the Secretary of Defense Research and Maintainability) study [AD-A137761] p 33 N84-20867

An evaluation of two reliability and maintainability information systems [AD-A143438] p 87 N84-33290

MAINTENANCE

A multi-item maintenance center inventory model for low-demand repairable items p 79 A84-45666

Issues in software maintenance [AD-A130622] p 40 N84-10786

Integrated logistic supportability (Aviation materiel) [AD-A132367] p 79 N84-13146

Techniques of condition monitoring and fault diagnosis in industry p 27 N84-13595

An approach to logistic problems by the L-transform method p 80 N84-15884

Guidance on software maintenance [PB84-128951] p 45 N84-18952

Research on shock models, wear processes, replacement and maintenance policies [AD-A135620] p 80 N84-19028

Mobilization and defense management technical reports series. Management implications of industrial support capabilities for Space Shuttle operations [AD-A137460] p 81 N84-19390

Artificial intelligence applications to maintenance technology working group report IDA/OSD R and M (Institute for Defense Analyses/Office of the Secretary of Defense Reliability and Maintainability) study [AD-A137329] p 33 N84-19827

Central Demand Data Base (CDDB) End Item Code (EIC) [AD-P002807] p 83 N84-23353

A development of logistics management models for the Space Transportation System [NASA-CR-173504] p 84 N84-23664

Computer science and technology: Selection of microcomputer systems p 51 N84-25331

The life cycle cost of integrated logistic support p 85 N84-26962

Comparing software development methodologies for Ada (trade name): A study plan [PB84-178029] p 53 N84-27491

Study of the FAA (Federal Aviation Administration) program to modernize maintenance operations [AD-A142285] p 86 N84-29848

MAN ENVIRONMENT INTERACTIONS

Situational interaction: A peer counseling approach to AWOL (unauthorized absences from duty) reduction [AD-P003243] p 7 N84-28410

MAN MACHINE SYSTEMS

DMS - A system for defining and managing human-computer dialogues p 1 A84-21640

An interactive system for supporting multiobjective decision making p 13 A84-21643

Modeling and analysis of teams of interacting decisionmakers with bounded rationality p 13 A84-21644

ARIADNE - A knowledge-based interactive system for planning and decision support p 14 A84-33463

Methods for improving the user-computer interface [AD-A132657] p 2 N84-14713

Integrated Software Engineering Facilities (ISEF) p 42 N84-14730

Modeling the user in intelligent user interfaces [DE84-012664] p 2 N84-14795

GENIE: A computer-based task for experiments in human-computer interaction [AD-A137473] p 3 N84-20181

A review of major issues relating to human-machine integration in the development of military systems [AD-A136739] p 3 N84-20184

Applied cognitive science p 4 N84-20185

Program Manager's Support System (PMSS): An update [AD-P002825] p 50 N84-23370

Computer developments at Institute of Automation and Electrometry described p 34 N84-23390

Research in man-machine interaction discussed p 6 N84-23393

Robotics impact on labor productivity examined p 35 N84-24104

Impact of Latvian Robotics Institute on industry modernization p 35 N84-24110

An analysis of naval aviation configuration status accounting [AD-A140473] p 84 N84-26460

Microcomputers: Introduction to features and uses [PB84-178821] p 53 N84-27456

The impact of communicating through computers p 53 N84-27457

Computer-automated technological innovation in three manufacturing sectors [AD-P003309] p 35 N84-28450

Management information systems: A need for human factors [AD-P003313] p 8 N84-28452

The structure of processing resource demands in monitoring automatic systems [AD-P003319] p 8 N84-28455

Psychophysiological tools in engineering psychology [AD-P003337] p 8 N84-28461

NOSC (Naval Ocean Systems Center)-Hawaii perceptual sciences research program [AD-P003361] p 9 N84-28474

- Video games: A human factors guide to visual display design and instructional system design
[AD-P003368] p 9 N84-28480
- A multiple processing resource explanation of the subjective dimensions of operator workload
[AD-A141455] p 9 N84-29480
- Interaction of human cognitive models and computer-based models in supervisory control
[AD-A142677] p 23 N84-30717
- Academician Varnos interviewed on automation related problems p 36 N84-34972
- MANAGEMENT**
- Psychology and the study of 'human factors' in management p 2 A84-11555
- Management. A continuing bibliography for NASA managers, with indexes
[NASA-SP-7500(18)] p 20 N84-26429
- Leadership, managership, and computers in today's Air Force
[AD-P003351] p 22 N84-28468
- Organizational structures, processes, and problems: A literature review and taxonomy
[AD-A140979] p 23 N84-28665
- Fault management p 23 N84-30709
- The relationship between administrative style and the use of computer-based systems: An attitudinal study of academic library professionals p 11 N84-32276
- Voluntary accounting systems for a small air carrier: Revenues, financial and traffic statistics
[PB84-210996] p 78 N84-32369
- MANAGEMENT ANALYSIS**
- R&D management and financial performance p 61 A84-15598
- Engineering tradeoff problems viewed as multiple objective optimizations and the VODCA methodology p 13 A84-31213
- Needs assessment for support units in an R & D organization p 61 A84-31214
- An evaluation of the effectiveness of project control systems p 61 A84-42621
- Organizational-climate dimensions: A conceptual and judgmental analysis
[AD-A132898] p 15 N84-18068
- A normative model of work team effectiveness
[AD-A136398] p 17 N84-20165
- Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150
- Contract requirements: A key to controlling DoD acquisition costs
[AD-P002828] p 76 N84-23373
- Incentives for new production discussed p 102 N84-23388
- Models of purposive human organization: A comparative study
[AD-A138871] p 19 N84-24491
- Interactive decision analysis and modelling
[CSIR-TWISK-294] p 20 N84-25403
- Control systems
[AD-A140901] p 21 N84-27592
- Development of a document preparation staff within an office automation environment
[DE84-008649] p 55 N84-31041
- MANAGEMENT INFORMATION SYSTEMS**
- An interactive system for supporting multiobjective decision making p 13 A84-21643
- Patent guidelines for research managers p 99 A84-42618
- Office automation management guide
[AD-A131770] p 41 N84-13012
- Knowledge base management for model management systems
[AD-A132211] p 15 N84-14062
- The determination of user information requirements during the development of management information systems
[AD-A132998] p 43 N84-14980
- Management information system for engineering
[DE84-001655] p 28 N84-14984
- An exploratory study of the use of an inexpensive cordless telephone as a part of a data communications link — management information in hospitals
[AD-A134228] p 44 N84-16432
- Information needs and system specifications for the B-1B executive information system p 45 N84-17054
- A program for developing automated scientific-information processing in maritime economy
[AD-A135518] p 45 N84-18107
- An approach to the design of a management information system: Development procedure for the Indonesian defense logistics staff
[AD-A134974] p 80 N84-18108
- Requirements analysis for forward funding tracking system, volume 1
[AD-A136840] p 46 N84-20425
- Requirements analysis for milestone tracking system, volume 2
[AD-A136841] p 46 N84-20426
- Human engineering guidelines for management information systems. Change 1
[AD-A137808] p 4 N84-21104
- Applications of operations research and management information system concepts to management of large software projects p 47 N84-21204
- Action Information Management System (AIMS): A user's view p 47 N84-21405
- Automated RTOP management system p 47 N84-21406
- Automated administrative data bases p 47 N84-21411
- NASA-wide standard administrative systems p 48 N84-21415
- Managing geometric information with a data base management system p 48 N84-22211
- Mechanized contract document preparation and abstract system
[AD-P002750] p 49 N84-23297
- The acquisition management information system: Friend or foe?
[AD-P002751] p 50 N84-23298
- Program Manager's Support System (PMSS): An update
[AD-P002825] p 50 N84-23370
- Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381
- Naval aviation IMA repair capability: A readiness to resources approach
[AD-A140465] p 84 N84-25612
- An analysis of naval aviation configuration status accounting
[AD-A140473] p 84 N84-26460
- Prototype development of an information-sharing and decision support system for the manpower personnel and training community
[AD-P003310] p 8 N84-28451
- Management information systems: A need for human factors
[AD-P003313] p 8 N84-28452
- Evaluating the availability, role, and performance of subcontractors in the aerospace industry
[AD-A141408] p 85 N84-29788
- Success with Data Management 4 at the DOE Pinellas Plant
[DE84-008021] p 55 N84-29802
- Appropriate technology management information system
[DE84-010952] p 56 N84-31056
- NASA Administrative Data Base Management Systems, 1984
[NASA-CP-2323] p 58 N84-33266
- Effective organizational solutions for implementation of DBMS software packages p 58 N84-33268
- Administrative automation in a scientific environment p 58 N84-33269
- The administrative window into the integrated DBMS p 58 N84-33270
- A user view of office automation or the integrated workstation p 58 N84-33271
- An evaluation of two reliability and maintainability information systems
[AD-A143438] p 87 N84-33290
- An exploratory analysis of the relationship between media richness and managerial information processing
[AD-A143503] p 24 N84-33293
- Sandia National Laboratories administrative data processing systems
[DE84-014328] p 59 N84-34202
- Managing microcomputers: A survival kit for functional managers
[AD-A144006] p 59 N84-34316
- The creation of a central database on a microcomputer network
[AD-A143875] p 59 N84-34326
- MANAGEMENT METHODS**
- Management of logistic support costs in the equipment acquisition phase p 79 A84-15213
- Software performance modeling and management p 89 A84-15218
- Human organization — and space project management p 59 A84-15303
- The progression of projects — in space industry p 60 A84-15305
- Management of a space project p 60 A84-15306
- Configuration and documentation management — for spacecraft development p 38 A84-15309
- Methods and practices of planning - Physical planning, resources, financial simulation p 12 A84-15312
- Risk assessment p 12 A84-15322
- Cost/schedule controls on major U.S. defense projects p 67 A84-15323
- The management of large projects - Case study: Ariane p 60 A84-15324
- Project management in the '80s
[MBB-UR-631-83-OE] p 61 A84-22854
- Integrated management in matrix organization p 13 A84-23989
- Managing creative individuals in high-technology research projects p 1 A84-23990
- Engineering tradeoff problems viewed as multiple objective optimizations and the VODCA methodology p 13 A84-31213
- Evolution in aerospace engineering organisation p 26 A84-32774
- Use of scientific potential in industry discusses p 26 N84-10353
- Project manager's guide
[DE83-014454] p 62 N84-11977
- Motivating managers: A guide to performance targeting and performance-based pay in state and local governments
[PB83-237834] p 14 N84-11978
- Quality is not a dirty word
[DE83-012166] p 90 N84-12510
- Information resources management plan
[AD-A131964] p 41 N84-13023
- Formal techniques in the management of software design
[AD-A132569] p 42 N84-13818
- Quality management in procurement p 91 N84-17601
- Guide to software conversion management
[PB84-118314] p 45 N84-18945
- Management of aerospace contract documentation by industry and government
[DE84-900451] p 47 N84-21396
- ORNL trends and balances, 1984-1989
[DE84-006320] p 63 N84-21397
- The application of management techniques to defence and other information services: The British approach p 48 N84-21433
- Material handling: A target for productivity improvement
[AD-P002829] p 83 N84-23374
- Problems of prompt adoption of new technology discussed p 50 N84-23396
- The nature and use of formal control systems for management control and strategy implementation
[AD-A139083] p 20 N84-24493
- Quality control in large systems development phase
[SNIAS-832-422-102] p 94 N84-25074
- Interactive decision analysis and modelling
[CSIR-TWISK-294] p 20 N84-25403
- Decision support for innovation management: Application to the lighting industry
[IIASA-RR-83-29] p 20 N84-25503
- Management. A continuing bibliography for NASA managers, with indexes
[NASA-SP-7500(18)] p 20 N84-26429
- The effects of task variability, sensory reinforcement, and monetary reinforcement on performance, satisfaction, and intrinsic motivation p 7 N84-27584
- An investigation of organizational climate: Definition, measurement, and usefulness as a diagnostic technique p 21 N84-27595
- Evaluating organizational change through improved understanding of managerial schemata p 21 N84-27596
- An analysis of relationships among size, technology and structure in a contextually limited setting p 21 N84-27597
- Evaluation of automated configuration management tools in ADA programming support environments
[AD-A140982] p 53 N84-28666
- Managing microcomputers: A survival kit for functional managers
[AD-A144006] p 59 N84-34316
- Master list and index to NASA directives
[NASA-TM-87362] p 59 N84-34321
- Decision-making process in management automation p 25 N84-34644
- MANAGEMENT PLANNING**
- The national air-space system contingency plan p 78 A84-10416
- Managerial decision-making in establishing R&M design goals p 89 A84-15211
- Software configuration management and its contribution to reliability program management p 89 A84-15217
- Fuzzy-network planning - FNET p 12 A84-15220
- Social-psychological problems in the evaluation of engineering personnel in automated systems for the control of developing enterprises p 1 A84-23706
- The occupational interests of R&D managers and technical specialists - Some preliminary findings p 61 A84-23988
- Software development management planning p 38 A84-24449

- Analogy in systems management - A theoretical inquiry p 13 A84-25008
- Avionics software management and control p 39 A84-26714
- ARIADNE - A knowledge-based interactive system for planning and decision support p 14 A84-33463
- The multiobjective multistage impact analysis method Theoretical basis p 14 A84-33465
- Methods and operational means for project management [MBB-UR-673-84-OE] p 61 A84-35922
- Organizational correlates of perceived role performance in the research laboratory p 14 A84-42619
- 'Reverse' transfers of technology from overseas subsidiaries to American firms p 61 A84-42620
- Planning the use of robots p 32 A84-42760
- Effects of science, technology on structure of production process p 26 N84-10351
- Project manager's guide [DE83-014454] p 62 N84-11977
- Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 3 [AD-A131878] p 27 N84-12051
- Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 2 [AD-A131877] p 27 N84-12052
- Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary [AD-A131876] p 27 N84-12053
- Ris assessment techniques: A handbook for program management personnel [AD-A131596] p 15 N84-13010
- Office automation management guide [AD-A131770] p 41 N84-13012
- Management of QA in an R and D organization [DE83-016924] p 90 N84-13014
- Information resources management plan [AD-A131964] p 41 N84-13023
- Reliability programs for nonelectronic designs, volume 2 [AD-A133625] p 91 N84-14528
- Project management techniques for highly integrated programs [NASA-TM-86023] p 63 N84-14965
- Life cycle costing in a dynamic environment [AD-A133023] p 70 N84-14967
- Factors explaining decisions to terminate or continue an R and D project, executive summary [PB83-256602] p 63 N84-14971
- Factors explaining decisions to terminate or continue an R and D project [PB83-256594] p 63 N84-14972
- Commercialization of opportunities for materials processing in low gravity [NASA-CR-170953] p 71 N84-15165
- Measuring quality achievements p 92 N84-17605
- A strategy for improving overhead cost control [AD-A134661] p 71 N84-18092
- Productivity improvement in a jobbing shop p 28 N84-18449
- System engineering management guide [AD-A136020] p 16 N84-19129
- Knowledge-based support systems for long range planning [AD-A137311] p 17 N84-20424
- Accuracy of software development activity data: The software cost reduction project [AD-A137639] p 71 N84-21122
- Progress in improving program and budget information for Congressional use [AD-A137491] p 72 N84-22511
- Office automation in the acquisition environment [AD-P002747] p 49 N84-23294
- The microcomputer in the acquisition environment [AD-P002748] p 49 N84-23295
- Paperless solicitation and contracting [AD-P002749] p 49 N84-23296
- Mechanized contract document preparation and abstract system [AD-P002750] p 49 N84-23297
- The acquisition management information system: Friend or foe? [AD-P002751] p 50 N84-23298
- Consolidation of DOD bidder's mailing list application [AD-P002752] p 81 N84-23299
- DECISION TECHNOLOGY: The catalyst for acquisition improvement [AD-P002755] p 18 N84-23302
- Designing the equitable risk contract [AD-P002756] p 81 N84-23303
- Assumption of risk in the R and D environment [AD-P002757] p 72 N84-23304
- Closing the gap between R and D and application in academe to better support government and industry [AD-P002761] p 63 N84-23308
- Training acquisition personnel through a local college [AD-P002766] p 6 N84-23313
- The make or buy decision—its nature and impact [AD-P002779] p 82 N84-23326
- Project: Acquisition strategy [AD-P002809] p 83 N84-23355
- Large firm efficiency, concentration, and profitability in defense markets [AD-P002810] p 75 N84-23356
- Quality assurance - Air Force Logistics Command [AD-P002816] p 93 N84-23361
- The avionics integrity program (AVIP) [AD-P002817] p 93 N84-23362
- Quality at the crossroads [AD-P002818] p 93 N84-23363
- Incentives for product quality need contract, cost, production and field co-operation [AD-P002819] p 93 N84-23364
- A quality improvement strategy for systems acquisition [AD-P002820] p 94 N84-23365
- Defense systems acquisition review process: A history and evaluation [AD-P002822] p 64 N84-23367
- A concept for mission-oriented planning for system acquisition at the Defense Communications Agency [AD-P002823] p 19 N84-23368
- Project management: Evolution and influence [AD-P002824] p 64 N84-23369
- Program Manager's Support System (PMSS): An update [AD-P002825] p 50 N84-23370
- Mortality and spareparts: A conceptual analysis [AD-P002826] p 83 N84-23371
- Contract requirements: A key to controlling DoD acquisition costs [AD-P002828] p 76 N84-23373
- Material handling: A target for productivity improvement [AD-P002829] p 83 N84-23374
- Strengthening small business participation in Department of Defense extramural research and development [AD-P002832] p 64 N84-23377
- Employment changes resulting from the award of contracts in labor surplus areas [AD-P002834] p 83 N84-23379
- Automating the source selection process [AD-P002835] p 84 N84-23380
- The Score technique: An analytical approach for assessing the results of manufacturing reviews [AD-P002838] p 30 N84-23383
- Industry urged to increase output of NC machine tool, robotics p 35 N84-23914
- Data envelopment analysis and extensions for decision support and management planning [AD-A139430] p 19 N84-24489
- The nature and use of formal control systems for management control and strategy implementation [AD-A139083] p 20 N84-24493
- Computer science and technology: Selection of microcomputer systems [PB84-167725] p 51 N84-25331
- Now: An initial approach to collection of major material systems actual costs [AD-A139845] p 76 N84-25505
- Unified database development program [AD-A140309] p 52 N84-26471
- AN/TPN-19 improvements program management plan [AD-A140728] p 84 N84-26690
- The decision for the optimal price in competitive bidding: The case of a Korean construction company [AD-A140556] p 65 N84-27585
- Increasing competition for spares within AFLC (Air Force Logistics Command) [AD-A140751] p 85 N84-27588
- Control systems [AD-A140901] p 21 N84-27592
- Relevant and irrelevant legal structures: Distinguishing private sector from DOD contracting [AD-P003241] p 102 N84-28408
- Behavioral issues in the management of technology [AD-P003349] p 9 N84-28467
- Incentive contracts and cost growth [AD-A140930] p 85 N84-28663
- LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 1 [AD-A141396] p 54 N84-29786
- LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 2 [AD-A141397] p 54 N84-29787
- Format requirements for scientific and technical reports prepared by or for the Department of Defense [AD-A141758] p 54 N84-29799
- Guidelines for contingency planning NASA (National Aeronautics and Space Administration) ADP security risk reduction decision studies [PB84-189836] p 55 N84-30737
- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 5: Composite function model of manufacture product (MFGO) [AD-A142337] p 35 N84-30766
- Development of a document preparation staff within an office automation environment [DE84-008649] p 55 N84-31041
- National Aeronautics and Space Administration's first-year implementation of the Federal Managers' Financial Integrity Act [PB84-188770] p 103 N84-31044
- The Program Planning Review (PPR): Milestone or milestone? [AD-P003493] p 87 N84-32259
- Some management initiatives to improve embedded commercial computer and training device life cycle support [AD-P003494] p 11 N84-32260
- Equitable assignment rules [AD-A142809] p 24 N84-32268
- Cost and schedule control systems criteria for contract performance measurement, information pamphlet [DE84-012576] p 78 N84-32269
- Parts on demand: Evaluation of approaches to achieve flexible manufacturing systems for Navy parts on demand, volume 1 [AD-A143248] p 31 N84-32830
- Determination of factors affecting performance and productivity in an engineering/design environment [AD-A143315] p 11 N84-33252
- Matrix management in DoD: An annotated bibliography [AD-A143316] p 24 N84-33253
- Effective organizational solutions for implementation of DBMS software packages p 58 N84-33268
- MANAGEMENT SYSTEMS**
- DMS - A system for defining and managing human-computer dialogues p 1 A84-21640
- The O'Hare Runway Configuration Management System p 79 A84-44732
- Airline Maintenance Management System (AMMS) p 79 A84-46582
- NU - A network monitoring, control, and management system p 40 A84-49262
- Benchmarking unstructured systems [DE83-011175] p 15 N84-14969
- ALDS project: Motivation, statistical database management issues, perspectives, and directions [DE84-001412] p 44 N84-14983
- Management input in quality p 92 N84-17602
- Design QA on a small batch project p 92 N84-17603
- Design of office information systems [AD-A136523] p 46 N84-19170
- NASA's emerging productivity program p 92 N84-21404
- Corporate DP planning: New approaches and new concerns — data processing (DP) [PNR-90180] p 50 N84-23386
- Important CAD/CAM utilization at MBB [MBB-Z-13-83-O] p 35 N84-26451
- Project management in the 80's [MBB-UR-631-83-O] p 65 N84-26454
- Configuration management with the Ada (trademark) language [AD-P003416] p 55 N84-30748
- Automated Construction Management System (ACMS). Volume 1: User's guide [AD-A143031] p 30 N84-31971
- Automated Construction Management System (ACMS). Volume 2: Program documentation [AD-A143032] p 30 N84-31972
- Software progress tracking system [AD-P003488] p 57 N84-32255
- MANIPULATORS**
- Industry official on progress in Soviet robotics program p 35 N84-23915
- MANPOWER**
- Scientists discuss increased production with fewer workers p 26 N84-10356
- Bottom Line Academia Conference — quality management education [AD-A131043] p 90 N84-11048
- A calculator adaptation of the Markov chain model for manpower analysis [AD-A132990] p 15 N84-14966
- Productivity and the forging industry p 28 N84-18448
- A review of major issues relating to human-machine integration in the development of military systems [AD-A136739] p 3 N84-20184

Prerequisites for the establishment of a professional acquisition workforce
[AD-P002763] p 5 N84-23310

Prototype development of an information-sharing and decision support system for the manpower personnel and training community
[AD-P003310] p 8 N84-28451

Evaluation of the HARDMAN comparability methodology for manpower, personnel and training
[NASA-CR-173733] p 9 N84-28485

MANUALS

Software quality measurement for distributed systems. Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129

Manual for implementing a Shared Time Engineering Program (STEP) September 1980 through September 1983
[PB84-144260] p 29 N84-21765

MANUFACTURING

Product liability in aviation and its insurability
p 96 A84-11311

Role of technology in promoting industrial competitiveness
[S-REPT-98-565] p 29 N84-19605

The Score technique: An analytical approach for assessing the results of manufacturing reviews
[AD-P002838] p 30 N84-23383

Industry urged to increase output of NC machine tool, robotics
p 35 N84-23914

Impact of Latvian Robotics Institute on industry modernization
p 35 N84-24110

Increasing competition for spares within AFLC (Air Force Logistics Command)
[AD-A140751] p 85 N84-27588

Computer-automated technological innovation in three manufacturing sectors
[AD-P003309] p 35 N84-28450

Parts on demand: Evaluation of approaches to achieve flexible manufacturing systems for Navy parts on demand, volume 1
[AD-A143248] p 31 N84-32830

Commentary on Philips R and D strategy, policies, major efforts
p 66 N84-34647

MARKET RESEARCH

Search among queues
[AD-A131639] p 70 N84-12773

Use of microcomputers for inventory management with uncertain demand
[DE84-005179] p 81 N84-21112

Large firm efficiency, concentration, and profitability in defense markets
[AD-P002810] p 75 N84-23356

Competitive assessment of the U.S. Civil aircraft industry
[PB84-154913] p 76 N84-25525

Report on U.S. domestic and international telecommunications and information markets
[PB84-166362] p 77 N84-27602

Computer science and technology: Introduction to software packages
[NBS-SP-500-114] p 55 N84-30740

MARKETING

Commercial communications satellite market and technology in the 90's
[IAF PAPER 83-86] p 66 A84-11739

The 'affordable' fighter market
p 68 A84-20599

The economics of space manufacturing - Some fundamental propositions
[AAS PAPER 83-243] p 68 A84-29882

The use of microcomputers for planned marketing
[MBB-UA-703-83-OE] p 69 A84-31794

Search among queues
[AD-A131639] p 70 N84-12773

Fiscal and monetary policy in a general equilibrium model
[AD-A138502] p 72 N84-22510

Research agenda in non-linear decision systems
[PB84-161207] p 19 N84-24102

Decision support for innovation management: Application to the lighting industry
[IIASA-RR-83-29] p 20 N84-25503

Value and competition
[SNIAS-832-501-101] p 76 N84-25504

Space Station commercial user development
[NASA-CR-173688] p 77 N84-27756

Profit responsibilities in the simulation and training equipment industry
[AD-P003497] p 77 N84-32263

MARKOV CHAINS

A calculator adaptation of the Markov chain model for manpower analysis
[AD-A132990] p 15 N84-14966

MATERIALS HANDLING

Scientist discusses problems in introducing new technology
p 62 N84-10357

Introduction to flexible manufacturing systems: Their applications, classification, and opportunities
[DE83-017373] p 33 N84-13868

Automated storage and retrieval systems—a consolidation of guidance for project management and implementation
[AD-A135571] p 80 N84-19175

Priorities for detailed quality assessments of the National Defense Stockpile nonfuel materials
[NMAB-403] p 93 N84-23011

Material handling: A target for productivity improvement
[AD-P002829] p 83 N84-23374

MATERIALS SCIENCE

Profitability of manufacturing in space in view of lunar industrial development and geo-socio-economic benefits
p 25 A84-22344

MATHEMATICAL MODELS

A calculator adaptation of the Markov chain model for manpower analysis
[AD-A132990] p 15 N84-14966

Interactive decision analysis and modelling
[CSIR-TWISK-294] p 20 N84-25403

Optimization methods in hierarchical holographic modeling
p 20 N84-26001

AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition
[AD-A144045] p 87 N84-33366

Validation of relative-time-spent rating scales
[AD-A144067] p 12 N84-34169

MATHEMATICAL PROGRAMMING

A development of logistics management models for the Space Transportation System
[NASA-CR-173504] p 84 N84-23664

MATRIX MANAGEMENT

Integrated management in matrix organization
p 13 A84-23989

Matrix management in DoD: An annotated bibliography
[AD-A143316] p 24 N84-33253

MECHANICAL ENGINEERING

Industry official on progress in Soviet robotics program
p 35 N84-23915

Commentary on Philips R and D strategy, policies, major efforts
p 66 N84-34647

MECHANIZATION

The impact of factory automation and robotics on the contracting and acquisition processes
[AD-P002830] p 34 N84-23375

MEDIA

An exploratory analysis of the relationship between media richness and managerial information processing
[AD-A143503] p 24 N84-33293

MEMORY

Assessment of learning abilities using rate measures
[AD-P003340] p 8 N84-28463

MENTAL PERFORMANCE

Development and application of a criterion task set for workload metric evaluation
[SAE PAPER 831419] p 1 A84-29482

Factor stability and construct validation of Yuki's MBS (Managerial Behavior Survey) for military leadership
[AD-P003246] p 21 N84-28413

Exploring the interaction of the Vroom/Yetton model and leadership style (LPC) (Least Preferred Coworker) as it predicts performance
[AD-P003247] p 22 N84-28414

Subordinate perceptions of contingent leaders: Do followers accept our theories?
[AD-P003248] p 22 N84-28415

Psychophysiological tools in engineering psychology
[AD-P003337] p 8 N84-28461

Assessment of learning abilities using rate measures
[AD-P003340] p 8 N84-28463

Age effects on active duty Army MMPI (Minnesota Multiphasic Personality Inventory) profiles
[AD-P003343] p 9 N84-28464

Computer-based measurement of intellectual capabilities
[AD-A144065] p 12 N84-34162

METAL WORKING

USSR report: Machine tools and metalworking equipment
[JPRS-UMM-84-008] p 34 N84-23913

METEOROLOGICAL SATELLITES

Transfer of civil meteorological satellites
[S-REPT-98-260] p 102 N84-24503

METRICATION

Software quality measurement for distributed systems, volume 1
[AD-A137955] p 92 N84-21128

MICROCOMPUTERS

The use of microcomputers for planned marketing
[MBB-UA-703-83-OE] p 69 A84-31794

Airline Maintenance Management System (AMMS)
p 79 A84-46582

Microcomputers: A tool for planning and scheduling construction projects
[PB83-211201] p 27 N84-11053

Computer science and technology: Microcomputer: A review of federal agency experiences
[PB83-238972] p 41 N84-11772

Tendering on a micro computer
p 28 N84-14700

Site computers
p 28 N84-14701

Microcomputer software system development: Suggested revisions to MIL-STD-1521A for cost-effective acquisition of custom software through software engineering
[AD-A134363] p 44 N84-16830

Requirements analysis for forward funding tracking system, volume 1
[AD-A136840] p 46 N84-20425

Use of microcomputers for inventory management with uncertain demand
[DE84-005179] p 81 N84-21112

The microcomputer in the acquisition environment
[AD-P002748] p 49 N84-23295

Development of a proposed standard for the exchange of scientific microcomputer programs
[PB84-157940] p 94 N84-24244

Computer science and technology: Selection of microcomputer systems
[PB84-167725] p 51 N84-25331

Microcomputers: Introduction to features and uses
[PB84-178821] p 53 N84-27456

Automated Construction Management System (ACMS). Volume 1: User's guide
[AD-A143031] p 30 N84-31971

Automated Construction Management System (ACMS). Volume 2: Program documentation
[AD-A143032] p 30 N84-31972

Microcomputers in transportation: Software and source book
[PB84-195155] p 87 N84-33067

Managing microcomputers: A survival kit for functional managers
[AD-A144006] p 59 N84-34316

The simulation of a major Automated Information System (AIS) on a microcomputer
[AD-A143599] p 59 N84-34323

The creation of a central database on a microcomputer network
[AD-A143875] p 59 N84-34326

MICROELECTRONICS

Future directions in large-scale scientific computing
[DE83-013229] p 40 N84-10807

MICROFILMS

MITS II (Microfiche Image Transmission System) investigations and design alternatives
[AD-A141040] p 54 N84-28673

MICROPROCESSORS

HQ AFSC selection of a microprocessor development system
[AD-A134930] p 45 N84-17891

Use of microcomputers for inventory management with uncertain demand
[DE84-005179] p 81 N84-21112

Use of robots in Estonian auto, machine tool industries viewed
p 35 N84-23916

MIDAIR COLLISIONS

Airspace management can be improved
p 78 A84-12185

MILITARY AIR FACILITIES

Timely application of advanced human factors test and evaluation techniques during the acquisition of new Air Force systems
p 1 A84-19308

MILITARY AIRCRAFT

A multi-period repair parts inventory model for a naval air rework facility
[AD-A136873] p 81 N84-19280

A comparison of simulator procurement/program practices: Military versus commercial
[AD-P003453] p 86 N84-32230

MILITARY HELICOPTERS

US military aircraft cost handbook
[AD-A136035] p 71 N84-18158

MILITARY OPERATIONS

Reliability programs for nonelectronic designs, volume 1
[AD-A133624] p 91 N84-14529

Integrated Computer-Aided Manufacturing (ICAM) architecture part 3. Volume 1: Architecture part 3: Accomplishments
[AD-A134249] p 33 N84-16829

A strategy for improving overhead cost control
[AD-A134661] p 71 N84-18092

A review of major issues relating to human-machine integration in the development of military systems
[AD-A136739] p 3 N84-20184

Reliability in space: Program manager and user awareness
[AD-P002148] p 94 N84-23813

- Evaluation of the BCT (Basic Cadet Training) paraprofessional counselor training at the United States Air Force Academy p 7 N84-28411
[AD-P003244]
- A model of inter-organizational influences on organizational processes p 23 N84-31037
[AD-A142450]
- An evaluation of two reliability and maintainability information systems p 87 N84-33290
[AD-A143438]
- AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition p 87 N84-33366
[AD-A144045]
- MILITARY PSYCHOLOGY**
- Environments for evaluating performance of C3I (Command, Control, Communications, and Intelligence) systems p 21 N84-28404
[AD-P003237]
- Relevant and irrelevant legal structures: Distinguishing private sector from DOD contracting p 102 N84-28408
[AD-P003241]
- Situational interaction: A peer counseling approach to AWOL (unauthorized absences from duty) reduction p 7 N84-28410
[AD-P003243]
- Evaluation of the BCT (Basic Cadet Training) paraprofessional counselor training at the United States Air Force Academy p 7 N84-28411
[AD-P003244]
- Factor stability and construct validation of Yuki's MBS (Managerial Behavior Survey) for military leadership p 21 N84-28413
[AD-P003246]
- Exploring the interaction of the Vroom/Yetton model and leadership style (LPC) (Least Preferred Coworker) as it predicts performance p 22 N84-28414
[AD-P003247]
- Subordinate perceptions of contingent leaders: Do followers accept our theories? p 22 N84-28415
[AD-P003248]
- To the wilderness and beyond: The application of a model for transformational change p 22 N84-28416
[AD-P003249]
- Affective determinants of job perceptions p 7 N84-28425
[AD-P003258]
- Leadership, managership, and computers in today's Air Force p 22 N84-28468
[AD-P003351]
- NOSC (Naval Ocean Systems Center)-Hawaii perceptual sciences research program p 9 N84-28474
[AD-P003361]
- Research integration: An essential for Department of Defense psychological research p 65 N84-28479
[AD-P003366]
- Video games: A human factors guide to visual display design and instructional system design p 9 N84-28480
[AD-P003368]
- MILITARY SPACECRAFT**
- The practical dimensions of space -- military and commercial utilization p 69 A84-38947
- MILITARY TECHNOLOGY**
- Contractor 'Hungriness' and the relative profitability of DoD business p 74 N84-23342
[AD-P002796]
- Data envelopment analysis and extensions for decision support and management planning p 19 N84-24489
[AD-A139430]
- Logistic support: A computer manufacturer's viewpoint p 87 N84-32262
[AD-P003496]
- Proceedings of the 5th Interservice-Industry Training Equipment Conference, volume 2 p 11 N84-32266
[AD-A142775]
- MILLING MACHINES**
- Manufacturing information system p 33 N84-20730
[AD-A137891]
- MISSION PLANNING**
- Space Station commercial user development p 77 N84-27756
[NASA-CR-173688]
- MOBILE COMMUNICATION SYSTEMS**
- The technical and economic considerations of bringing satellite communications to small mobile users p 69 A84-37900
- MODELS**
- Manufacturing information system p 33 N84-20730
[AD-A137891]
- To the wilderness and beyond: The application of a model for transformational change p 22 N84-28416
[AD-P003249]
- Affective determinants of job perceptions p 7 N84-28425
[AD-P003258]
- MODULES**
- Automated interface management for modular software development p 38 A84-16649
- MONITORS**
- NU - A network monitoring, control, and management system p 40 A84-49262

- Techniques of condition monitoring and fault diagnosis in industry p 27 N84-13595
- MONOTONY**
- Significance of allowing for individual differences in organizing the work shift in monotonous production work p 2 A84-32353
- MONTE CARLO METHOD**
- Equal weights, flat maxima, and trivial decisions p 18 N84-22342
[AD-A138506]
- MORTALITY**
- Mortality and spareparts: A conceptual analysis p 83 N84-23371
[AD-P002826]
- MOTIVATION**
- Motivating managers: A guide to performance targeting and performance-based pay in state and local governments p 14 N84-11978
[PB83-237834]
- The design of effective reward systems p 3 N84-16067
[AD-A132859]
- Motivation and performance appraisal behavior p 3 N84-17842
[AD-A134311]
- Motivation and work performance: A comparative and analytical study p 6 N84-27441
- The effects of task variability, sensory reinforcement, and monetary reinforcement on performance, satisfaction, and intrinsic motivation p 7 N84-27584
- Affective determinants of job perceptions p 7 N84-28425
[AD-P003258]
- MTBF**
- Optimum warranty policies for nonreparable items p 89 A84-15216

N

- NASA PROGRAMS**
- Forecasting trends in NASA flight software development tools p 38 A84-10065
[AIAA PAPER 83-2334]
- International competition in commercial aerospace markets p 68 A84-29883
[AAS PAPER 83-244]
- Encouraging business ventures in space technologies p 68 A84-29885
[AAS PAPER 83-246]
- Preferences on technical report format - Results of a survey p 39 A84-33153
- Recommendations for NASA research and development in artificial intelligence p 32 N84-11817
[NASA-CR-170585]
- NASA patent abstracts bibliography. Section 1: Abstracts. A continuing bibliography p 100 N84-13017
[NASA-SP-7039(23)-SECT-1]
- NASA Patent Abstracts Bibliography. Section 2: Indexes. A continuing bibliography (supplement 23) p 100 N84-13018
[NASA-SP-7039(23)-SECT-2]
- Ada and the NASA software environment p 43 N84-14749
- NASA patent abstracts bibliography. Section 1: Abstracts p 101 N84-20432
[NASA-SP-7039(24)-SECT-1]
- Patent abstracts bibliography, a continuing bibliography. Section 2: Indexes p 101 N84-20433
[NASA-SP-7039(24)-SECT-2]
- NASA's emerging productivity program p 92 N84-21404
- NASA-wide standard administrative systems p 48 N84-21415
- National Aeronautics and Space Administration Authorization Act, 1985 p 101 N84-21443
- National Aeronautics and Space Administration Authorization Act, 1985 p 101 N84-21444
[H-REPT-98-629]
- National Aeronautics and Space Administration Authorization Bill, 1984 p 102 N84-24506
[S-REPT-98-455]
- The 1985 NASA authorization p 102 N84-25526
[GPO-31-453]
- Future of aeronautics p 30 N84-25529
[GPO-29-744]
- Guidelines for developing NASA (National Aeronautics and Space Administration) ADP security risk management plans p 52 N84-26317
[NASA-CR-173564]
- Guidelines for contingency planning NASA (National Aeronautics and Space Administration) ADP security risk reduction decision studies p 55 N84-30737
[PB84-189836]
- National Aeronautics and Space Administration's first-year implementation of the Federal Managers' Financial Integrity Act p 103 N84-31044
[PB84-188770]
- NASA Administrative Data Base Management Systems, 1984 p 58 N84-33266
[NASA-CP-2323]
- Master list and index to NASA directives p 59 N84-34321
[NASA-TM-87362]

- Review of the National Aeronautics and Space Act of 1958, as amended p 103 N84-35134
[GPO-38-705]
- NATIONAL AIRSPACE UTILIZATION SYSTEM**
- Improving the air traffic control system: An assessment of the National Airspace System Plan p 80 N84-16160
- NAVY**
- Navy AI programs - With emphasis on applications -- Artificial Intelligence p 31 A84-10022
[AIAA PAPER 83-2349]
- NETWORK ANALYSIS**
- Fuzzy-network planning - FNET p 12 A84-15220
[AD-A134255]
- Network analysis utilizing computer graphics p 14 A84-31781
- Research in network management techniques for tactical data communications networks p 40 N84-11365
[AD-A131357]
- Estimating critical path and arc probabilities in stochastic activity networks p 16 N84-16925
[AD-A134255]
- The ROE file system p 52 N84-26473
[AD-A140497]
- Stochastic bounds on distributions of optimal value functions with applications to PERT, network flow and reliability p 21 N84-27593
[REPT-81]
- Automated Construction Management System (ACMS). Volume 1: User's guide p 30 N84-31971
[AD-A143031]
- Report of the Information Technology Workshop p 37 N84-35126
[AD-A144212]
- NETWORK CONTROL**
- Gridnet - An alternative large distributed network p 39 A84-31351
- NU - A network monitoring, control, and management system p 40 A84-49262
- NONLINEAR SYSTEMS**
- Research agenda in non-linear decision systems p 19 N84-24102
[PB84-161207]
- NORMALITY**
- Age effects on active duty Army MMPI (Minnesota Multiphasic Personality Inventory) profiles p 9 N84-28464
[AD-P003343]
- NUCLEAR ELECTRIC POWER GENERATION**
- Aerospace technology and commercial nuclear power; Proceedings of the Workshop Conference, Williamsburg, VA, November 18-20, 1981 -- Book p 25 A84-19449
- NUMERICAL CONTROL**
- Automating the source selection process p 84 N84-23380
[AD-P002835]
- Development of Integrated Programs for Aerospace-vehicle Design (IPAD). IPAD user requirements: Implementation (first-level IPAD) p 30 N84-28776
[NASA-CR-162713]
- DBMS conversion case study p 55 N84-31054
[DE84-011205]
- ON-LINE SYSTEMS**
- Automated RTOP management system p 47 N84-21406
- Automated administrative data bases p 47 N84-21411
- Method for accessing distributed heterogeneous databases p 47 N84-21412
- NASA-wide standard administrative systems p 48 N84-21415
- SIRIUS: Bibliographic search and retrieval system p 52 N84-25512
[INPE-2771-PRE/344]
- Local automation model: System specification p 54 N84-29798
[AD-A141503]
- Success with Data Management 4 at the DOE Pinellas Plant p 55 N84-29802
[DE84-008021]
- NASA Administrative Data Base Management Systems, 1984 p 58 N84-33266
[NASA-CP-2323]
- The administrative window into the integrated DBMS p 58 N84-33270
- A user view of office automation or the integrated workstation p 58 N84-33271
- Scientific and technical information transfer: Issues and options p 65 N84-33286
[RAND/N-2131-NSF]
- OPERATING COSTS**
- Analysis of the influence of the load factor in planning aircraft transport capacity p 68 A84-25192
- Productivity and the forging industry p 28 N84-18448
- OPERATING SYSTEMS (COMPUTERS)**
- Decentralized resource management for embedded computers p 37 A84-10048
[AIAA PAPER 83-2405]

O

OPERATOR PERFORMANCE

- The influence of forms of work organization on personal responsibility in production work p 1 A84-14981
 Robotics impact on labor productivity examined p 35 N84-24104
 The structure of processing resource demands in monitoring automatic systems [AD-P003319] p 8 N84-28455

OPERATORS (PERSONNEL)

- Methods for improving the user-computer interface [AD-A132657] p 2 N84-14713
 A multiple processing resource explanation of the subjective dimensions of operator workload [AD-A141455] p 9 N84-29480

OPTIMIZATION

- Optimum warranty policies for nonreparable items p 89 A84-15216
 The multiobjective multistage impact analysis method Theoretical basis p 14 A84-33465
 Disjunctive programming and a hierarchy of relaxations for discrete optimization problems [AD-A132004] p 15 N84-12784
 System engineering management guide [AD-A136020] p 16 N84-19129
 Material handling: A target for productivity improvement [AD-P002829] p 83 N84-23374
 Optimization methods in hierarchical holographic modeling p 20 N84-26001
 The decision for the optimal price in competitive bidding: The case of a Korean construction company [AD-A140556] p 65 N84-27585
 Stochastic bounds on distributions of optimal value functions with applications to PERT, network flow and reliability [REPT-81] p 21 N84-27593

ORBITAL SPACE STATIONS

- Role of a space station in pharmaceutical manufacturing p 25 A84-24632

ORGANIZATIONS

- Human organization --- and space project management p 59 A84-15303
 Integrated management in matrix organization p 13 A84-23989
 Evolution in aerospace engineering organization p 26 A84-32774
 Organizational correlates of perceived role performance in the research laboratory p 14 A84-42619
 The effectiveness of project managers - Implications of a political model of influence p 14 A84-42622
 Project management: Evolution and influence [AD-P002824] p 64 N84-23369
 Social support and performance in complex organizations [AD-A138888] p 6 N84-24098
 Models of purposive human organization: A comparative study [AD-A138871] p 19 N84-24491
 Science in the European Economic Community: A self-assessment and a detailed plan of action [AD-A139078] p 102 N84-24492
 An investigation of organizational climate: Definition, measurement, and usefulness as a diagnostic technique p 21 N84-27595
 Evaluating organizational change through improved understanding of managerial schemata p 21 N84-27596
 An analysis of relationships among size, technology and structure in a contextually limited setting p 21 N84-27597
 Organizational structures, processes, and problems: A literature review and taxonomy [AD-A140979] p 23 N84-28665
 A field study of Air Force organization structures [AD-A142389] p 23 N84-31035
- OXYGEN METABOLISM**
 Physical performance tests as predictors of task performance [AD-P003257] p 7 N84-28424

P**PACKET SWITCHING**

- NU - A network monitoring, control, and management system p 40 A84-49262

PATENT APPLICATIONS

- Patent guidelines for research managers p 99 A84-42618

PATENT POLICY

- Patent guidelines for research managers p 99 A84-42618
 NASA patent abstracts bibliography. Section 1: Abstracts. A continuing bibliography [NASA-SP-7039(23)-SECT-1] p 100 N84-13017

- NASA Patent Abstracts Bibliography. Section 2: Indexes. A continuing bibliography (supplement 23) [NASA-SP-7039(23)-SECT-2] p 100 N84-13018
 Further delineation of the utilization of scientific literature by U.S. patents [PB84-1200734] p 100 N84-18095
 NASA patent abstracts bibliography. Section 1: Abstracts [NASA-SP-7039(24)-SECT-1] p 101 N84-20432
 Patent abstracts bibliography, a continuing bibliography. Section 2: Indexes [NASA-SP-7039(24)-SECT-2] p 101 N84-20433
 Incentives for new production discussed p 102 N84-23388

PATENTS

- Design patents [PB83-224063] p 100 N84-14985
 Further delineation of the utilization of scientific literature by U.S. patents [PB84-100734] p 100 N84-18095
 Licensing computer software: Basic considerations as to protection and licensing of computer software and its implications for developing countries [PB84-150689] p 101 N84-22295

PATTERN METHOD (FORECASTING)

- Two-level compromise designs for estimating main effects and detecting interactions [DE84-002997] p 16 N84-18094
 Scenario planning: Energy considerations in the long range urban transportation planning process [DE84-013590] p 87 N84-33308

PATTERN RECOGNITION

- Industry official on progress in Soviet robotics program p 35 N84-23915

PERCEPTION

- Determination of factors affecting performance and productivity in an engineering/design environment [AD-A143315] p 11 N84-33252

PERFORMANCE

- Motivating managers: A guide to performance targeting and performance-based pay in state and local governments [PB83-237834] p 14 N84-11978

PERFORMANCE PREDICTION

- A study of critical factors affecting the development of performance measures in evaluating bibliographic information retrieval systems p 41 N84-13030
 Reliability programs for nonelectronic designs, volume 1 [AD-A133624] p 91 N84-14529
 Individual differences in learning rate [AD-P003338] p 8 N84-28462

PERFORMANCE TESTS

- Managing test-procedures to achieve reliable software p 89 A84-15219
 Timely application of advanced human factors test and evaluation techniques during the acquisition of new Air Force systems p 1 A84-19308
 A guide to macro and micro computer performance evaluation [AD-A140127] p 51 N84-25329
 Human factors engineering. Part 2: HEDGE (Human factors engineering data guide for evaluation) [AD-A140391] p 6 N84-26303
 Subordinate perceptions of contingent leaders: Do followers accept our theories? [AD-P003248] p 22 N84-28415
 To the wilderness and beyond: The application of a model for transformational change [AD-P003249] p 22 N84-28416
 Qualification testing and electrical measurement experience: A manufacturer's view p 96 N84-32705
- PERIPHERAL EQUIPMENT (COMPUTERS)**
 Benchmarking the selection and projection operations and ordering capabilities of relational database machines [AD-A136776] p 46 N84-20438

PERSONAL COMPUTERS

- A user view of office automation or the integrated workstation p 58 N84-33271

PERSONNEL

- Situational interaction: A peer counseling approach to AWOL (unauthorized absences from duty) reduction [AD-P003243] p 7 N84-28410
 The impact of a computerized network on the quality of work life in two college of advanced education libraries in New South Wales p 9 N84-29792
 Development of a document preparation staff within an office automation environment [DE84-008649] p 55 N84-31041
 Proceedings of the 5th Interservice-Industry Training Equipment Conference, volume 2 [AD-A142775] p 11 N84-32266
 Determination of factors affecting performance and productivity in an engineering/design environment [AD-A143315] p 11 N84-33252

PERSONNEL DEVELOPMENT

- The occupational interests of R&D managers and technical specialists - Some preliminary findings p 61 A84-23988
 A study of temporary task teams --- team spirit development in solving complex technical problems or preparing engineering studies p 2 A84-31212
 Bottom Line Academia Conference --- quality management education [AD-A131043] p 90 N84-11048
 Training feedback handbook [AD-A132565] p 2 N84-14683
 Evaluation results for the interactive video competency recognition system [AD-A133052] p 2 N84-15796
 Prerequisites for the establishment of a professional acquisition workforce [AD-P002763] p 5 N84-23310
 Training requirements for changing times [AD-P002764] p 5 N84-23311
 Training acquisition personnel through a local college [AD-P002766] p 6 N84-23313
 Government - contractor interaction [AD-P002768] p 63 N84-23315
 Saab claims world's most modern engine-assembly plant p 34 N84-23800
 Microcomputers: Introduction to features and uses [PB84-178821] p 53 N84-27456
 Exploring the interaction of the Vroom/Yetton model and leadership style (LPC) (Least Preferred Coworker) as it predicts performance [AD-P003247] p 22 N84-28414
 Affective determinants of job perceptions [AD-P003258] p 7 N84-28425
 Prototype development of an information-sharing and decision support system for the manpower personnel and training community [AD-P003310] p 8 N84-28451
 Evaluation of the HARDMAN comparability methodology for manpower, personnel and training [NASA-CR-173733] p 9 N84-28485
 Development of a document preparation staff within an office automation environment [DE84-008649] p 55 N84-31041
 Ada (Trademark) training considerations [AD-P003560] p 10 N84-31164
 Validation of relative-time-spent rating scales [AD-A144067] p 12 N84-34169
 An analysis of the effectiveness of the problem solving skills for managers training package-USCG [AD-A144017] p 12 N84-34317
- PERSONNEL MANAGEMENT**
 Conflicts among employees and ways of resolving them p 1 A84-14980
 The influence of forms of work organization on personal responsibility in production work p 1 A84-14981
 Managing engineers effectively p 13 A84-15600
 Managing creative individuals in high-technology research projects p 1 A84-23990
 Organizational correlates of perceived role performance in the research laboratory p 14 A84-42619
 The effectiveness of project managers - Implications of a political model of influence p 14 A84-42622
 Revitalization: An organizational program for the individual [DE83-014949] p 2 N84-13013
 A calculator adaptation of the Markov chain model for manpower analysis [AD-A132990] p 15 N84-14966
 Performance appraisal revisited [AD-A132841] p 3 N84-16059
 The design of effective reward systems [AD-A132859] p 3 N84-16067
 Organizational-climate dimensions: A conceptual and judgmental analysis [AD-A132898] p 15 N84-16068
 Motivation and performance appraisal behavior [AD-A134311] p 3 N84-17842
 A set of organizational-climate measures: Internal consistency, factor structure, and predictive power [AD-A135352] p 16 N84-19132
 A review of major issues relating to human-machine integration in the development of military systems [AD-A136739] p 3 N84-20184
 Personnel technology: Performance appraisal, a process approach [AD-A138359] p 4 N84-23112
 Projecting manpower to attain quality p 5 N84-23148
 Managers handbook for software development [NASA-TM-85604] p 49 N84-23150
 Assessing contracting workforce requirements in the matrixed organization [AD-P002760] p 5 N84-23307

- A dynamic personnel assignment model in the R and D environment
[AD-P002765] p 5 N84-23312
- Improving the effectiveness of award fee contracts for program management support services
[AD-P002827] p 75 N84-23372
- Employment changes resulting from the award of contracts in labor surplus areas
[AD-P002834] p 83 N84-23379
- Research in man-machine interaction discussed
p 6 N84-23393
- Biological clocks and shift work scheduling
[GPO-29-312] p 6 N84-25277
- Guide to reporting time in the financial information system at ANL
[DE84-009356] p 6 N84-25524
- Motivation and work performance: A comparative and analytical study
p 6 N84-27441
- Affective determinants of job perceptions
[AD-P003258] p 7 N84-28425
- The structure of processing resource demands in monitoring automatic systems
[AD-P003319] p 8 N84-28455
- Behavioral issues in the management of technology
[AD-P003349] p 9 N84-28467
- Evaluation of the HARDMAN comparability methodology for manpower, personnel and training
[NASA-CR-173733] p 9 N84-28485
- Interaction of human cognitive models and computer-based models in supervisory control
[AD-A142677] p 23 N84-30717
- Development of a document preparation staff within an office automation environment
[DE84-008649] p 55 N84-31041
- Equitable assignment rules
[AD-A142809] p 24 N84-32268
- Matrix management in DoD: An annotated bibliography
[AD-A143316] p 24 N84-33253
- Validation of relative-time-spent rating scales
[AD-A144067] p 12 N84-34169
- An analysis of the effectiveness of the problem solving skills for managers training package-USCG
[AD-A144017] p 12 N84-34317
- PERSONNEL SELECTION**
- Social-psychological problems in the evaluation of engineering personnel in automated systems for the control of developing enterprises p 1 A84-23706
- The occupational interests of R&D managers and technical specialists - Some preliminary findings
p 61 A84-23988
- Psychophysiological tools in engineering psychology
[AD-P003337] p 8 N84-28461
- Realization of human work capacity: Interdisciplinary problems p 10 N84-31920
- PERT**
- Stochastic bounds on distributions of optimal value functions with applications to PERT, network flow and reliability
[REPT-81] p 21 N84-27593
- PETROLEUM PRODUCTS**
- Tactical buying decisions for strategic petroleum reserve spot procurements: The tunnel theory
[AD-P002612] p 75 N84-23358
- PHOTOVOLTAIC CELLS**
- Qualification testing and electrical measurement experience: A manufacturer's view p 96 N84-32705
- PHYSICAL FITNESS**
- Physical performance tests as predictors of task performance
[AD-P003257] p 7 N84-28424
- PHYSIOLOGICAL EFFECTS**
- Realization of human work capacity: Interdisciplinary problems p 10 N84-31920
- PHYSIOLOGICAL TESTS**
- Physical performance tests as predictors of task performance
[AD-P003257] p 7 N84-28424
- PILOT PERFORMANCE**
- Development and application of a criterion task set for workload metric evaluation
[SAE PAPER 831419] p 1 A84-29482
- PLANNING**
- ORNL trends and balances, 1984-1989
[DE84-006320] p 63 N84-21397
- Air Force Systems Command research planning guide (research objectives)
[AD-A138651] p 64 N84-23384
- POLICIES**
- Emerging government regulation of American space entrepreneurs
[AAS PAPER 83-227] p 99 A84-29870
- Sixth all-union congress of inventors held p 62 N84-11043

- Policy and legal issues involved in the commercialization of space
[GPO-21-495] p 100 N84-11069
- Fiscal and monetary policy in a general equilibrium model
[AD-A138502] p 72 N84-22510
- Project: Acquisition strategy
[AD-P002809] p 83 N84-23355
- Use of economic mechanisms in managing scientific and technical progress p 76 N84-23389
- Transfer of civil meteorological satellites
[S-REPT-98-260] p 102 N84-24503
- Contract audit followup: Its impact on defense contracting
[AD-A140627] p 85 N84-27587
- Master list and index to NASA directives
[NASA-TM-87362] p 59 N84-34321
- POLITICS**
- The effectiveness of project managers - Implications of a political model of influence p 14 A84-42622
- Progress in improving program and budget information for Congressional use
[AD-A137491] p 72 N84-22511
- POSITION (TITLE)**
- Toward an interpersonal paradigm for superior-subordinate communication
[AD-A135863] p 17 N84-20166
- POWER CONDITIONING**
- I/O channel interface
[NBS-FIPS-PUB-60-2] p 57 N84-33057
- PREDICTION ANALYSIS TECHNIQUES**
- Equal weights, flat maxima, and trivial decisions
[AD-A138506] p 18 N84-22342
- On 'Before' and 'After' cost comparisons
[AD-P002799] p 75 N84-23345
- The introduction of uncertainty techniques to the productivity investment fund
[AD-A140864] p 20 N84-27591
- Physical performance tests as predictors of task performance
[AD-P003257] p 7 N84-28424
- Psychophysiological tools in engineering psychology
[AD-P003337] p 8 N84-28461
- Evaluation of the HARDMAN comparability methodology for manpower, personnel and training
[NASA-CR-173733] p 9 N84-28485
- Validation of relative-time-spent rating scales
[AD-A144067] p 12 N84-34169
- PREJUDICES**
- The relationship between administrative style and the use of computer-based systems: An attitudinal study of academic library professionals p 11 N84-32276
- PRIVACY**
- Information systems, security and privacy
[RAND/P-6930] p 47 N84-21402
- PROBLEM SOLVING**
- Conflicts among employees and ways of resolving them p 1 A84-14980
- Analogy in systems management - A theoretical inquiry p 13 A84-25008
- Disjunctive programming and a hierarchy of relaxations for discrete optimization problems
[AD-A132004] p 15 N84-12784
- Information resources management plan
[AD-A131964] p 41 N84-13023
- On the facial structure of scheduling polyhedra
[AD-A136983] p 17 N84-20427
- Prerequisites for scientific-technical progress enumerated p 50 N84-23395
- On a series of problems with machines: Costs of modernization and storage in case of demand
[TUM-M8312] p 30 N84-25863
- Situational interaction: A peer counseling approach to AWOL (unauthorized absences from duty) reduction
[AD-P003243] p 7 N84-28410
- Appropriate Technology Small Grants Program evaluation, volume 2
[DE84-010674] p 102 N84-31039
- Applying artificial intelligence to large networks p 36 N84-31743
- An analysis of the effectiveness of the problem solving skills for managers training package-USCG
[AD-A144017] p 12 N84-34317
- PROCESS CONTROL (INDUSTRY)**
- Report on development, installation of industrial robots p 32 N84-11339
- Fault management p 23 N84-30709
- PROCUREMENT**
- Integrated bid estimate systems for contractors p 70 N84-14699
- Software Acquisition Resource Expenditure (SARE) data collection methodology
[AD-A137084] p 71 N84-20247
- Information search in judgment tasks: The effects of unequal cue validity and cost
[AD-A141712] p 23 N84-29437

- DBMS conversion case study
[DE84-011205] p 55 N84-31054
- Comparative analysis of government and private sector ADP acquisition
[AD-A144523] p 59 N84-35131
- PROCUREMENT MANAGEMENT**
- Reliability programs for commercial communication satellites p 88 A84-15209
- Timely application of advanced human factors test and evaluation techniques during the acquisition of new Air Force systems p 1 A84-19308
- The launch and performance of spacecraft - An insurance perspective p 97 A84-20646
- An innovative approach to supplier cost control p 69 A84-46348
- Life cycle costing in a dynamic environment
[AD-A133023] p 70 N84-14967
- Microcomputer software system development: Suggested revisions to MIL-STD-1521A for cost-effective acquisition of custom software through software engineering
[AD-A134363] p 44 N84-16830
- Quality management in procurement p 91 N84-17601
- Consolidation of DOD bidder's mailing list application
[AD-P002752] p 81 N84-23299
- An intelligent manual for price analysis
[AD-P002798] p 75 N84-23344
- 1982 US Army Materiel Development and Readiness Command (DARCOM) integrated logistic support (ILS) study finding on contracting for ILS
[AD-P002805] p 82 N84-23351
- Improving the effectiveness of award fee contracts for program management support services
[AD-P002827] p 75 N84-23372
- Information search in judgment tasks: The effects of unequal cue validity and cost p 23 N84-29437
- DBMS conversion case study
[DE84-011205] p 55 N84-31054
- Managing aircraft/simulator concurrency
[AD-P003463] p 86 N84-32240
- AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition
[AD-A144045] p 87 N84-33366
- PROCUREMENT POLICY**
- Optimum warranty policies for nonreparable items p 89 A84-15216
- Selection of multiple sources in weapon systems acquisition
[AD-P002837] p 84 N84-23382
- A comparison of simulator procurement/program practices: Military versus commercial
[AD-P003453] p 86 N84-32230
- Effectiveness of multi-year and advance procurement contracts p 86 N84-32239
- AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition
[AD-A144045] p 87 N84-33366
- Comparative analysis of government and private sector ADP acquisition
[AD-A144523] p 59 N84-35131
- PRODUCT DEVELOPMENT**
- Building an information model (with the help of PSL/PSA) --- Problem Statement Language/Problem Statement Analyzer
[AIAA PAPER 83-2329] p 37 A84-10011
- Hughes' software engineering procedures improve quality - Do they help productivity?
[AIAA PAPER 83-2357] p 88 A84-10027
- Implementing software productivity measures
[AIAA PAPER 83-2360] p 66 A84-10029
- Software configuration management and its contribution to reliability program management p 89 A84-15217
- R&D and quality assurance partnership p 90 A84-15597
- Profitability of manufacturing in space in view of lunar industrial development and geo-socio-economic benefits p 25 A84-22344
- Software development management planning p 38 A84-24449
- Role of a space station in pharmaceutical manufacturing p 25 A84-24632
- Crisis avoidance in a software management situation p 38 A84-26710
- Reliability programs for nonelectronic designs, volume 2
[AD-A133625] p 91 N84-14528
- The software engineering environment project model (PROMOD) p 42 N84-14737
- The role of quality assurance in the development of software for space applications p 91 N84-14743
- Functional requirements for the development and use of a software-cost database
[AD-B079998] p 72 N84-22287

PROJECT MANAGEMENT

- A-25

Ris assessment techniques: A handbook for program management personnel [AD-A131596] p 15 N84-13010

Management of QA in an R and D organization [DE83-016924] p 90 N84-13014

Keeping your fingers crossed won't help p 28 N84-14702

Computer simulation of construction operations p 28 N84-14704

Is critical path planning the answer --- computer techniques in project management p 15 N84-14705

Construction planning and control: Current practice and continuing challenges p 28 N84-14706

The project library PLUS: A general overview p 43 N84-14751

Project management techniques for highly integrated programs [NASA-TM-86023] p 63 N84-14965

Factors explaining decisions to terminate or continue an R and D project, executive summary [PB83-256602] p 63 N84-14971

Factors explaining decisions to terminate or continue an R and D project [PB83-256594] p 63 N84-14972

The dynamics of software development project management: An integrative systems dynamic perspective [NASA-CR-175342] p 44 N84-16824

Design QA on a small batch project p 92 N84-17603

Automated storage and retrieval systems--a consolidation of guidance for project management and implementation [AD-A135571] p 80 N84-19175

Computer generation of plan of action and milestone schedule [AD-A137057] p 46 N84-20244

Requirements analysis for forward funding tracking system, volume 1 [AD-A136840] p 46 N84-20425

NASA's emerging productivity program p 92 N84-21404

Action Information Management System (AIMS): A user's view p 47 N84-21405

Monitoring software development through dynamic variables p 49 N84-23139

Managers handbook for software development [NASA-TM-85604] p 49 N84-23150

Managing for success in defense systems acquisition [AD-P002789] p 64 N84-23336

Project management: Evolution and influence [AD-P002824] p 64 N84-23369

Improving the effectiveness of award fee contracts for program management support services [AD-P002827] p 75 N84-23372

Assessment of the NASA Flight Assurance Review Program [NASA-CR-173418] p 94 N84-23401

Reliability in space: Program manager and user awareness [AD-P002148] p 94 N84-23813

Profitability improvement of projects by early consideration of life cycle cost reduction [MBB-UR-620-83-O] p 76 N84-24495

Transfer of civil meteorological satellites [S-REPT-98-260] p 102 N84-24503

Quality control in large systems development phase [SNIAS-832-422-102] p 94 N84-25074

Optimization methods in hierarchical holographic modeling p 20 N84-26001

Product assurance management and audit systems for ESA spacecraft and associated equipment [ESA-PSS-01-10-ISSUE-1] p 95 N84-26035

Project management in the 80's [MBB-UR-631-83-O] p 65 N84-26454

AN/TPN-19 improvements program management plan [AD-A140728] p 84 N84-26690

Microcomputers: Introduction to features and uses [PB84-178821] p 53 N84-27456

Comparing software development methodologies for Ada (trade name): A study plan [PB84-178029] p 53 N84-27491

Guideline for computer security certification and accreditation. Category: ADP (Automatic Data Processing) operations. Subcategory: Computer security. Federal information processing standards [FIPS-PUB-102] p 55 N84-30736

Appropriate Technology Small Grants Program evaluation, volume 1: Executive summary [DE84-010675] p 102 N84-31038

Appropriate technology management information system [DE84-010952] p 56 N84-31056

National Airspace Review: Implementation plan [AD-A145379] p 86 N84-31107

Cost/schedule management for software development [AD-P003591] p 56 N84-31196

Managing a low quantity, high technology trainer development program [AD-P003464] p 11 N84-32241

Administrative automation in a scientific environment p 58 N84-33269

Difficulties of scientific and technological planning [INPE-2786-PRE/352] p 24 N84-34308

Decision-making process in management automation p 25 N84-34644

PROJECT PLANNING

The progression of projects --- in space industry p 60 N84-15305

Methods and practices of planning - Physical planning, resources, financial simulation p 12 N84-15312

Identifying operative goals by modeling project selection decisions in research and development p 12 N84-15599

Crisis avoidance in a software management situation p 38 N84-26710

The use of microcomputers for planned marketing [MBB-UA-703-83-OE] p 69 N84-31794

Construction planning and control: Current practice and continuing challenges p 28 N84-14706

Two-level compromise designs for estimating main effects and detecting interactions [DE84-002997] p 16 N84-18094

Managers handbook for software development [NASA-TM-85604] p 49 N84-23150

Corporate DP planning: New approaches and new concerns --- data processing (DP) [PNR-90180] p 50 N84-23386

Incentives for new production discussed p 102 N84-23388

Technical and economic indicators for industrial technological institutes p 76 N84-23392

Optimization methods in hierarchical holographic modeling p 20 N84-26001

Computer-based measurement of intellectual capabilities [AD-A144065] p 12 N84-34162

Difficulties of scientific and technological planning [INPE-2786-PRE/352] p 24 N84-34308

PROTOTYPES

Reducing design prototyping and production cycle times and costs --- in robotic assembly p 31 N84-17159

PROVING

Validation of relative-time-spent rating scales [AD-A144067] p 12 N84-34169

PSYCHOLOGICAL EFFECTS

Psychological and biochemical effects of a stress management program [AD-P003300] p 7 N84-28447

Realization of human work capacity: Interdisciplinary problems p 10 N84-31920

PSYCHOLOGICAL FACTORS

Social-psychological problems in the evaluation of engineering personnel in automated systems for the control of developing enterprises p 1 N84-23706

The occupational interests of R&D managers and technical specialists - Some preliminary findings p 61 N84-23988

Significance of allowing for individual differences in organizing the work shift in monotonous production work p 2 N84-32353

Revitalization: An organizational program for the individual [DE83-014949] p 2 N84-13013

The human side of robotics: Results from a prototype study on how workers react to a robot [AD-A133438] p 33 N84-15805

Organizational-climate dimensions: A conceptual and judgmental analysis [AD-A132898] p 15 N84-16068

Video games: A human factors guide to visual display design and instructional system design [AD-P003368] p 9 N84-28480

The relationship between administrative style and the use of computer-based systems: An attitudinal study of academic library professionals p 11 N84-32276

PSYCHOLOGICAL TESTS

Age effects on active duty Army MMPI (Minnesota Multiphasic Personality Inventory) profiles [AD-P003343] p 9 N84-28464

Computer-based measurement of intellectual capabilities [AD-A144065] p 12 N84-34162

PSYCHOLOGY

Psychology and the study of 'human factors' in management p 2 N84-41555

Toward an interpersonal paradigm for superior-subordinate communication [AD-A135863] p 17 N84-20166

An overview of productivity improvement efforts in Army organizations [AD-A138589] p 19 N84-24490

PSYCHOMOTOR PERFORMANCE

NOSC (Naval Ocean Systems Center)-Hawaii perceptual sciences research program [AD-P003361] p 9 N84-28474

PUBLIC LAW

Contractor fraud: Government response [AD-P002833] p 101 N84-23378

Paperwork Reduction Act of 1980 [S-REPT-98-479] p 102 N84-24504

PULSE COMMUNICATION

Analysis of modern analog and digital communication channels from a manager's perspective [AD-A143161] p 57 N84-31494

Q

QUALIFICATIONS

Qualification testing and electrical measurement experience: A manufacturer's view p 96 N84-32705

QUALITY CONTROL

Hughes' software engineering procedures improve quality - Do they help productivity? [AIAA PAPER 83-2357] p 88 N84-10027

Issues affecting software standards to ensure quality and productivity [AIAA PAPER 83-2358] p 88 N84-10028

The fine art of accepting an airliner p 25 N84-11274

Reliability programs for commercial communication satellites p 88 N84-15209

Management of large space projects - Quality assurance or 'product assurance' p 89 N84-15310

R&D and quality assurance partnership p 90 N84-15597

Bottom Line Academia Conference --- quality management education [AD-A131043] p 90 N84-11048

Quality is not a dirty word [DE83-012166] p 90 N84-12510

Management of QA in an R and D organization [DE83-016924] p 90 N84-13014

Reliability programs for nonelectronic designs, volume 2 [AD-A133625] p 91 N84-14528

Reliability programs for nonelectronic designs, volume 1 [AD-A133624] p 91 N84-14529

The role of quality assurance in the development of software for space applications p 91 N84-14743

Quality management in procurement p 91 N84-17601

Management input in quality p 92 N84-17602

Design QA on a small batch project p 92 N84-17603

Measuring quality achievements p 92 N84-17605

Priorities for detailed quality assessments of the National Defense Stockpile nonfuel materials [NMAB-403] p 93 N84-23011

Quality assurance - Air Force Logistics Command [AD-P002816] p 93 N84-23361

The avionics integrity program (AVIP) [AD-P002817] p 93 N84-23362

Quality at the crossroads [AD-P002818] p 93 N84-23363

A quality improvement strategy for systems acquisition [AD-P002820] p 94 N84-23365

Engine product performance agreements and the future [AD-P002821] p 94 N84-23366

Assessment of the NASA Flight Assurance Review Program [NASA-CR-173418] p 94 N84-23401

Quality control in large systems development phase [SNIAS-832-422-102] p 94 N84-25074

Quality Assurance (QA) procedures for computer software in department 1510 [DE84-012131] p 95 N84-30778

Software progress tracking system [AD-P003488] p 57 N84-32255

Scientific and technical information transfer: Issues and options [RAND/N-2131-NSF] p 65 N84-33286

ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing. Volume 4, part 5, task D: Quality assurance/quality, control/technical requirement/tasks, quality assurance modeling and analysis, architecture for product assurance, (TTD) [AD-A144691] p 37 N84-34999

QUEUEING THEORY

Search among queues [AD-A131639] p 70 N84-12773

A development of logistics management models for the Space Transportation System [NASA-CR-173504] p 84 N84-23664

R

RATINGS

Performance appraisal revisited [AD-A132841] p 3 N84-16059
Motivation and performance appraisal behavior [AD-A134311] p 3 N84-17842
Personnel technology: Performance appraisal, a process approach [AD-A138359] p 4 N84-23112
A multiple processing resource explanation of the subjective dimensions of operator workload [AD-A141455] p 9 N84-29480

READING

The function of report components in the screening and reading of technical reports p 40 A84-45547

REAL TIME OPERATION

A host-target programming support environment for the production of high-quality real-time systems p 43 N84-14753

Data base management of software development [AD-P003486] p 57 N84-32253

RECONNAISSANCE AIRCRAFT

US military aircraft cost handbook [AD-A136035] p 71 N84-18158

RECORDS

Paperwork Reduction Act of 1980 [S-REPT-98-479] p 102 N84-24504

REDUCTION

Bottom Line Academia Conference — quality management education [AD-A131043] p 90 N84-11048

REGRESSION ANALYSIS

Statistical models for estimating overhead costs [AD-A137351] p 71 N84-20444
An analysis of the effectiveness of the problem solving skills for managers training package—USCG [AD-A144017] p 12 N84-34317

REGULATIONS

Impact of current U.S. policy on international civil aviation p 97 A84-20675
Regulations and the air ambulance p 97 A84-24961
Airworthiness directives - Recovering the cost of compliance p 97 A84-25032
Air carrier liability under deregulation p 97 A84-25033

Effects of FAR 25.1309 on airplane operation and maintenance [SAE PAPER 831405] p 98 A84-29626

The effect of regulation 25.1309 on aircraft design and maintenance [SAE PAPER 831406] p 98 A84-29627

A legal charter for non-governmental space industrialization [AAS PAPER 83-225] p 98 A84-29868

Emerging government regulation of American space entrepreneurs [AAS PAPER 83-227] p 99 A84-29870

Deregulation and commuter airline safety p 99 A84-36942

Federal government regulation of commercial operations using expendable launch vehicles p 99 A84-43365

Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 3 [AD-A131878] p 27 N84-12051

Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 2 [AD-A131877] p 27 N84-12052

Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary [AD-A131876] p 27 N84-12053

Integrated logistic supportability (Aviation material) [AD-A132367] p 79 N84-13146

Deregulating the airlines: An economic analysis [PB83-250019] p 100 N84-14070

Security, a set of rules or an approach — cryptography [NLR-MP-82047-U] p 47 N84-20442

Needed help for the Federal Acquisition Regulation Council [AD-P002769] p 101 N84-23316

Nailing down the liability issue once and for all [AD-P002777] p 101 N84-23324

Relevant and irrelevant legal structures: Distinguishing private sector from DOD contracting [AD-P003241] p 102 N84-28408

National Airspace Review: Implementation plan [AD-A145379] p 86 N84-31107

Master list and index to NASA directives [NASA-TM-87362] p 59 N84-34321

REINFORCEMENT (PSYCHOLOGY)

The effects of task variability, sensory reinforcement, and monetary reinforcement on performance, satisfaction, and intrinsic motivation p 7 N84-27584

RELATIONSHIPS

An exploratory analysis of the relationship between media richness and managerial information processing [AD-A143503] p 24 N84-33293

RELAXATION METHOD (MATHEMATICS)

Disjunctive programming and a hierarchy of relaxations for discrete optimization problems [AD-A132004] p 15 N84-12784

RELIABILITY

Measuring quality achievements p 92 N84-17605
Artificial intelligence applications to maintenance technology working group report IDA/OSD R and M (Institute for Defense Analyses/Office of the Secretary of Defense Reliability and Maintainability) study [AD-A137329] p 33 N84-19827

CAD/CAM technology working group report IDA/OSD R/M (Institute for Defense Analyses/Office of the Secretary of Defense Research and Maintainability) study [AD-A137761] p 33 N84-20867

Assessment of the NASA Flight Assurance Review Program [NASA-CR-173418] p 94 N84-23401

Improving system affordability [AD-A142387] p 77 N84-31062

An evaluation of two reliability and maintainability information systems [AD-A143438] p 87 N84-33290

RELIABILITY ANALYSIS

Reliability cost estimation - Managerial perspectives p 66 A84-15215

Optimum warranty policies for nonreparable items p 89 A84-15216

Managing test-procedures to achieve reliable software p 89 A84-15219

Effects of FAR 25.1309 on airplane operation and maintenance [SAE PAPER 831405] p 98 A84-29626

A study of critical factors affecting the development of performance measures in evaluating bibliographic information retrieval systems p 41 N84-13030

Reliability programs for nonelectronic designs, volume 2 [AD-A133625] p 91 N84-14528

Reliability programs for nonelectronic designs, volume 1 [AD-A133624] p 91 N84-14529

RELIABILITY ENGINEERING

Planning for reliability growth [AIAA PAPER 83-2776] p 88 A84-12356

Reliability programs for commercial communication satellites p 88 A84-15209

Managerial decision-making in establishing R&M design goals p 89 A84-15211

Software configuration management and its contribution to reliability program management p 89 A84-15217

Fuzzy-network planning - FNET p 12 A84-15220

Gridnet - An alternative large distributed network p 39 A84-31351

A multi-item maintenance center inventory model for low-demand repairable items p 79 A84-45666

A technical overview of the National Software Works [AD-A132320] p 42 N84-13827

Management input in quality p 92 N84-17602

Engine product performance agreements and the future [AD-P002821] p 94 N84-23366

Reliability in space: Program manager and user awareness [AD-P002148] p 94 N84-23813

REMOTE MANIPULATOR SYSTEM

Use of robots in Estonian auto, machine tool industries viewed p 35 N84-23916

REMOTE SENSING

New opportunities for the private sector in space technology p 69 A84-49145

REMOTE SENSORS

NOSC (Naval Ocean Systems Center)-Hawaii perceptual sciences research program [AD-P003361] p 9 N84-28474

REMOTELY PILOTED VEHICLES

Reliability program development and implementation for a remote piloted vehicle p 88 A84-15208

REPORTS

The function of report components in the screening and reading of technical reports p 40 A84-45547
Report format preferences of technical managers and nonmanagers p 40 A84-45572

Assessment of the NASA Flight Assurance Review Program [NASA-CR-173418] p 94 N84-23401

REQUIREMENTS

Space Station commercial user development [NASA-CR-173688] p 77 N84-27756

AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition [AD-A144045] p 87 N84-33366

RESEARCH AND DEVELOPMENT

Navy AI programs - With emphasis on applications — Artificial Intelligence [AIAA PAPER 83-2349] p 31 A84-10022

R&D and quality assurance partnership p 90 A84-15597

R&D management and financial performance p 61 A84-15598

Identifying operative goals by modeling project selection decisions in research and development p 12 A84-15599

The occupational interests of R&D managers and technical specialists - Some preliminary findings p 61 A84-23988

Cost estimation of research and development projects [ASME PAPER 83-WA/MGT-4] p 69 A84-30646

Needs assessment for support units in an R & D organization p 61 A84-31214

Computer research in Japan p 39 A84-31347

'Reverse' transfers of technology from overseas subsidiaries to American firms p 61 A84-42620

An evaluation of the effectiveness of project control systems p 61 A84-42621

The effectiveness of project managers - Implications of a political model of influence p 14 A84-42622

Scientists discuss increased production with fewer workers p 26 N84-10356

Further delineation of the utilization of scientific literature by U.S. patents [PB84-100734] p 100 N84-18095

Management of aerospace contract documentation by industry and government p 48 N84-21434

National Aeronautics and Space Administration Authorization Act, 1985 p 101 N84-21443

National Aeronautics and Space Administration Authorization Act, 1985 p 101 N84-21444

Strengthening small business participation in Department of Defense extramural research and development [AD-P002832] p 64 N84-23377

Use of economic mechanisms in managing scientific and technical progress p 76 N84-23389

Prerequisites for scientific-technical progress enumerated p 50 N84-23395

The 1985 NASA authorization [GPO-31-453] p 102 N84-25526

Future of aeronautics [GPO-29-744] p 30 N84-25529

Unified database development program [AD-A140309] p 52 N84-26471

Appropriate Technology Small Grants Program evaluation, volume 1: Executive summary [DE84-010675] p 102 N84-31038

Appropriate Technology Small Grants Program evaluation, volume 2 [DE84-010674] p 102 N84-31039

The influence of Computer Aided Design (CAD) on research — aircraft design [NLR-MP-83028-U] p 36 N84-31984

Commentary on Philips R and D strategy, policies, major efforts p 66 N84-34647

The ESA technological research programs p 66 N84-34717

RESEARCH FACILITIES

Joint industry/university cooperation with federally supported research facilities [GPO-24-902] p 100 N84-18115

RESEARCH MANAGEMENT

R&D management and financial performance p 61 A84-15598

The occupational interests of R&D managers and technical specialists - Some preliminary findings p 61 A84-23988

Managing creative individuals in high-technology research projects p 1 A84-23990

Cost estimation of research and development projects [ASME PAPER 83-WA/MGT-4] p 69 A84-30646

Needs assessment for support units in an R & D organization p 61 A84-31214

Patent guidelines for research managers p 99 A84-42618

Organizational correlates of perceived role performance in the research laboratory p 14 A84-42619

'Reverse' transfers of technology from overseas subsidiaries to American firms p 61 A84-42620

- Report format preferences of technical managers and nonmanagers p 40 A84-45572
 Papers for and a summary of a Workshop on The Role of Basic Research in Science and Technology: Case Studies in Energy R and D (Research and Development) [PB83-213637] p 62 N84-11052
 A methodology for collecting valid software engineering data [AD-A131332] p 41 N84-11781
 Strengthening the government-university partnership in science [PB83-230870] p 100 N84-11979
 Information retrieval research support [AD-A131990] p 41 N84-13022
 Factors explaining decisions to terminate or continue an R and D project, executive summary [PB83-256602] p 63 N84-14971
 Factors explaining decisions to terminate or continue an R and D project [PB83-256594] p 63 N84-14972
 Research on shock models, wear processes, replacement and maintenance policies [AD-A135620] p 80 N84-19028
 National Aeronautics and Space Administration Authorization Act, 1985 p 101 N84-21443
 National Aeronautics and Space Administration Authorization Act, 1985 [H-REPT-98-629] p 101 N84-21444
 A survey of European robotics research [AD-A138952] p 34 N84-23122
 Assumption of risk in the R and D environment [AD-P002757] p 72 N84-23304
 Closing the gap between R and D and application in academe to better support government and industry [AD-P002761] p 63 N84-23308
 Strengthening small business participation in Department of Defense extramural research and development [AD-P002832] p 64 N84-23377
 Air Force Systems Command research planning guide (research objectives) [AD-A138851] p 64 N84-23384
 Experimental design: Review and comment [AD-A139268] p 19 N84-24309
 The 1985 NASA authorization [GPO-31-453] p 102 N84-25526
 Research integration: An essential for Department of Defense psychological research [AD-P003366] p 65 N84-28479
 Format requirements for scientific and technical reports prepared by or for the Department of Defense [AD-A141758] p 54 N84-29799
 Appropriate Technology Small Grants Program evaluation, volume 2 [DE84-010674] p 102 N84-31039
 Technology transfer revisited [DE84-012233] p 65 N84-32293
 Parts on demand: Evaluation of approaches to achieve flexible manufacturing systems for Navy parts on demand, volume 1 [AD-A143248] p 31 N84-32830
 Difficulties of scientific and technological planning [INPE-2786-PRE/352] p 24 N84-34308
 ESA and its programs: Present and future p 66 N84-34716
- RESEARCH PROJECTS**
 Navy AI programs - With emphasis on applications -- Artificial Intelligence [AIAA PAPER 83-2349] p 31 A84-10022
 Identifying operative goals by modeling project selection decisions in research and development p 12 A84-15599
 Managing creative individuals in high-technology research projects p 1 A84-23990
 Japan's next generation of robots p 32 A84-31346
 An evaluation of the effectiveness of project control systems p 61 A84-42621
 ORNL trends and balances, 1984-1989 [DE84-006320] p 63 N84-21397
- RESOURCES**
 Two-step industrial preparedness planning: Balancing funds and production capability [AD-P002802] p 29 N84-23348
- RESOURCES MANAGEMENT**
 Impact of corporate resource allocation decisions on national security objectives: Dissynergism in aerospace industrial resource planning [AD-P002801] p 29 N84-23347
 Improved management of support resources [AD-P002808] p 83 N84-23354
- RISK**
 Risk assessment p 12 A84-15322
 Space insurance - Issues and problems p 96 A84-16892
 The launch and performance of spacecraft - An insurance perspective p 97 A84-20646
- Ris assessment techniques: A handbook for program management personnel [AD-A131596] p 15 N84-13010
 Management of risk and uncertainty in systems acquisition: Proceedings of the 1983 Defense Risk and Uncertainty Workshop [AD-A136230] p 16 N84-19124
 Cost risk trade-offs in timing the production decision [AD-P002753] p 29 N84-23300
 Managing program risk: One way to reduce cost growth [AD-P002754] p 72 N84-23301
 DECISION TECHNOLOGY: The catalyst for acquisition improvement [AD-P002755] p 18 N84-23302
 Designing the equitable risk contract [AD-P002756] p 81 N84-23303
 Assumption of risk in the R and D environment [AD-P002757] p 72 N84-23304
 Cost risk and contract type: A normative model [AD-P002781] p 73 N84-23328
 An application of the causal-integrative model [AD-P002786] p 18 N84-23333
 Risk analysis: Comparing different contract types [AD-P002788] p 74 N84-23335
 Guidelines for developing NASA (National Aeronautics and Space Administration) ADP security risk management plans [NASA-CR-173564] p 52 N84-26317
 Guidelines for development of NASA (National Aeronautics and Space Administration) computer security training programs [NASA-CR-173562] p 52 N84-26318
 Interactive risk analysis and development of standardized factors [AD-A140758] p 77 N84-27473
 The introduction of uncertainty techniques to the productivity investment fund [AD-A140864] p 20 N84-27591
 Guidelines for contingency planning NASA (National Aeronautics and Space Administration) ADP security risk reduction decision studies [PB84-189836] p 55 N84-30737
- ROBOTICS**
 Japan's next generation of robots p 32 A84-31346
 Planning the use of robots p 32 A84-42760
 The human side of robotics: Results from a prototype study on how workers react to a robot [AD-A133438] p 33 N84-15805
 A survey of European robotics research [AD-A138952] p 34 N84-23122
 The impact of factory automation and robotics on the contracting and acquisition processes [AD-P002830] p 34 N84-23375
 Saab claims world's most modern engine-assembly plant p 34 N84-23800
 USSR report: Machine tools and metalworking equipment [JPRS-UMM-84-008] p 34 N84-23913
 Industry urged to increase output of NC machine tool, robotics p 35 N84-23914
 Industry official on progress in Soviet robotics program p 35 N84-23915
 Use of robots in Estonian auto, machine tool industries viewed p 35 N84-23916
 Robotics impact on labor productivity examined p 35 N84-24104
 Impact of Latvian Robotics Institute on industry modernization p 35 N84-24110
 Impact of robots and computers on the work force of the 1980's [GPO-31-912] p 36 N84-32826
 Midi-robots get underway in September: Lab-industry link p 36 N84-34649
 Report of the Information Technology Workshop [AD-A144212] p 37 N84-35126
- ROBOTS**
 Reducing design prototyping and production cycle times and costs -- in robotic assembly p 31 A84-17159
 Report on development, installation of industrial robots p 32 N84-11339
 The human side of robotics: Results from a prototype study on how workers react to a robot [AD-A133438] p 33 N84-15805
 Midi-robots get underway in September: Lab-industry link p 36 N84-34649
- ROUTES**
 Microcomputers in transportation: Software and source book [PB84-195155] p 87 N84-33067
- RUNWAYS**
 The O'Hare Runway Configuration Management System p 79 A84-44732
- SAFETY**
 Safety training priorities [AD-A141711] p 95 N84-29026
- SAFETY FACTORS**
 System safety in aircraft acquisition [AD-A141492] p 95 N84-28763
- SAFETY MANAGEMENT**
 Risk management - A necessary tool for satellite owners and users p 69 A84-34770
 The Aviation Safety Analysis System (ASAS) - An overview p 90 A84-41079
- SATELLITE IMAGERY**
 New opportunities for the private sector in space technology p 69 A84-49145
- SATELLITE LIFETIME**
 The launch and performance of spacecraft - An insurance perspective p 97 A84-20646
 Risk management - A necessary tool for satellite owners and users p 69 A84-34770
- SATELLITE NETWORKS**
 Commercial communications satellite market and technology in the 90's [IAF PAPER 83-86] p 66 A84-11739
- SATELLITE TRANSMISSION**
 The Apollo concept: Electronic document delivery by satellite [ESA-SP-1048] p 46 N84-19179
- SCHEDULES**
 Cost/schedule management for software development [AD-P003591] p 56 N84-31196
 Cost and schedule control systems criteria for contract performance measurement, information pamphlet [DE84-012576] p 78 N84-32269
- SCHEDULING**
 Fuzzy-network planning - FNET p 12 A84-15220
 Biological clocks and shift work scheduling [GPO-21-747] p 2 N84-12713
 Artificial intelligence techniques for industrial applications in job shop scheduling [AD-A132164] p 32 N84-13867
 On the facial structure of scheduling polyhedra [AD-A136983] p 17 N84-20427
 The Program Planning Review (PPR): Milestone or milestone? [AD-P003493] p 87 N84-32259
 ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing. Volume 4, part 5, task D: Quality assurance/quality, control/technical requirement/tasks, quality assurance modeling and analysis, architecture for product assurance, (TTD) [AD-A144691] p 37 N84-34999
- SCIENTISTS**
 Organizational correlates of perceived role performance in the research laboratory p 14 A84-42619
 Sixth all-union congress of inventors held p 62 N84-11043
 Applications of academic research neglected by industry p 62 N84-11044
 Report of the DOD-University forum working group on engineering and science education [AD-A138205] p 5 N84-23292
 Problems of prompt adoption of new technology discussed p 50 N84-23396
- SCORING**
 The Score technique: An analytical approach for assessing the results of manufacturing reviews [AD-P002838] p 30 N84-23383
- SCREENING**
 The function of report components in the screening and reading of technical reports p 40 A84-45547
- SEARCH PROFILES**
 A study of critical factors affecting the development of performance measures in evaluating bibliographic information retrieval systems p 41 N84-13030
- SELECTION**
 On using selection procedures with binomial models [AD-A135275] p 16 N84-17957
- SELECTIVE DISSEMINATION OF INFORMATION**
 Management of aerospace contract documentation by industry and government p 48 N84-21434
 Technology transfer [H-REPT-98-15] p 65 N84-25528
- SEQUENCING**
 On the facial structure of scheduling polyhedra [AD-A136983] p 17 N84-20427
- SERVICE LIFE**
 Mortality and spareparts: A conceptual analysis [AD-P002826] p 83 N84-23371
- SERVOCONTROL**
 Use of robots in Estonian auto, machine tool industries viewed p 35 N84-23916

SET THEORY

- Disjunctive programming and a hierarchy of relaxations for discrete optimization problems
[AD-A132004] p 15 N84-12784

SHOPS

- Artificial intelligence techniques for industrial applications in job shop scheduling
[AD-A132164] p 32 N84-13867

SIMULATORS

- Data base management of software development
[AD-P003486] p 57 N84-32253

SOCIAL FACTORS

- Social-psychological problems in the evaluation of engineering personnel in automated systems for the control of developing enterprises p 1 A84-23706
Psychology and the study of 'human factors' in management p 2 A84-41555
A normative model of work team effectiveness
[AD-A136398] p 17 N84-20165
Societal versus individual decision making: How they might differ
[IZF-1983-20] p 18 N84-22166
Social support and performance in complex organizations
[AD-A138888] p 6 N84-24098
Relevant and irrelevant legal structures: Distinguishing private sector from DOD contracting
[AD-P003241] p 102 N84-28408
The impact of a computerized network on the quality of work life in two college of advanced education libraries in New South Wales p 9 N84-29792
Academician Varnos interviewed on automation related problems p 36 N84-34972

SOCIOLOGY

- Performance appraisal revisited
[AD-A132841] p 3 N84-16059
Equal weights, flat maxima, and trivial decisions
[AD-A138508] p 18 N84-22342

SOFTWARE ENGINEERING

- DMS - A system for defining and managing human-computer dialogues p 1 A84-21640
Software engineering economics p 68 A84-24448
Software development management planning p 38 A84-24449
Software engineering project standards p 90 A84-24450
Crisis avoidance in a software management situation p 38 A84-26710
Software control and system configuration management - A process that works p 38 A84-26713
Avionics software management and control p 39 A84-26714
Formal techniques in the management of software design
[AD-A132569] p 42 N84-13818
Integrated Software Engineering Facilities (ISEF) p 42 N84-14730
The Integrated Software Engineering Facilities (ISEF) software configuration management system p 42 N84-14732
The software engineering environment project model (PROMOD) p 42 N84-14737
Coherent management support in the Ada environment p 43 N84-14748
A host-target programming support environment for the production of high-quality real-time systems p 43 N84-14753
The dynamics of software development project management: An integrative systems dynamic perspective
[NASA-CR-175342] p 44 N84-16824
Microcomputer software system development: Suggested revisions to MIL-STD-1521A for cost-effective acquisition of custom software through software engineering
[AD-A134363] p 44 N84-16830
Guide to software conversion management
[PB84-118314] p 45 N84-18945
Guidance on software maintenance
[PB84-128951] p 45 N84-18952
Accuracy of software development activity data: The software cost reduction project
[AD-A137639] p 71 N84-21122
Analyzing program methodologies using software science
[AD-A138121] p 93 N84-22259
Monitoring software development through dynamic variables p 49 N84-23139
Projecting manpower to attain quality p 5 N84-23148
A guide to macro and micro computer performance evaluation
[AD-A140127] p 51 N84-25329
Comparing software development methodologies for Ada (trade name): A study plan
[PB84-178029] p 53 N84-27491

- Computer science and technology: Introduction to software packages
[NBS-SP-500-114] p 55 N84-30740
Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers' guide: Volume 1
[AD-A142430] p 10 N84-30768
Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers' guide: Volume 2
[AD-A142431] p 10 N84-30769
Ada (Registered trademark) training curriculum. Software engineering for managers. M101: Teachers guide
[AD-A142432] p 10 N84-30770
Software control and system configuration management: A systems-wide approach
[NASA-TM-85908] p 56 N84-31112
Cost/schedule management for software development
[AD-P003591] p 56 N84-31196
Automated Construction Management System (ACMS). Volume 2: Program documentation
[AD-A143032] p 30 N84-31972
Software progress tracking system
[AD-P003488] p 57 N84-32255

SOFTWARE TOOLS

- The NASA Software Management and Assurance Program
[AIAA PAPER 83-2336] p 37 A84-10015
Evolution of a source library system -- for software engineering
[AIAA PAPER 83-2427] p 37 A84-10062
Forecasting trends in NASA flight software development tools
[AIAA PAPER 83-2334] p 38 A84-10065
Software performance modeling and management p 89 A84-15218
Automated interface management for modular software development p 38 A84-16649
Tools for the creation of IMS database designs from Entity-Relationship diagrams
[DE84-000592] p 42 N84-14066
Software configuration management p 43 N84-14742
Coherent management support in the Ada environment p 43 N84-14748
The project library PLUS: A general overview p 43 N84-14751
A host-target programming support environment for the production of high-quality real-time systems p 43 N84-14753
ANSI Ada and the UK M-CHAPSE p 91 N84-14760
Specifications for a federal information processing standard data dictionary system p 93 N84-21414
Licensing computer software: Basic considerations as to protection and licensing of computer software and its implications for developing countries
[PB84-150689] p 101 N84-22295
Computer Aided Source Selection (CASS)
[AD-P002785] p 50 N84-23332
A data management and presentation tool for engineering and research
[NLR-MP-83044-U] p 53 N84-27482

SOLAR ARRAYS

- Qualification testing and electrical measurement experience: A manufacturer's view p 96 N84-32705

SOLAR ENERGY

- Appropriate technology management information system
[DE84-010952] p 56 N84-31056

SOLAR POWER SATELLITES

- Financing a solar power satellite project p 68 A84-21482

SOLID WASTES

- Workshop on Systems Analysis
[PB84-194661] p 24 N84-33138

SPACE COMMERCIALIZATION

- Role of a space station in pharmaceutical manufacturing p 25 A84-24632
Major concerns of private enterprise regarding recent developments in space law
[AAS PAPER 83-221] p 98 A84-29865
A legal charter for non-governmental space industrialization
[AAS PAPER 83-225] p 98 A84-29868
Contemporary business outlook for large space ventures
Financing, management, construction
[AAS PAPER 83-242] p 68 A84-29881
The economics of space manufacturing - Some fundamental propositions
[AAS PAPER 83-243] p 68 A84-29882
International competition in commercial aerospace markets
[AAS PAPER 83-244] p 68 A84-29883
Encouraging business ventures in space technologies
[AAS PAPER 83-246] p 68 A84-29885

- The technical and economic considerations of bringing satellite communications to small mobile users p 69 A84-37900

- The practical dimensions of space -- military and commercial utilization p 69 A84-38947
Federal government regulation of commercial operations using expendable launch vehicles p 99 A84-43365

- Legal aspects of commercial space activities p 99 A84-44852

- New opportunities for the private sector in space technology p 69 A84-49145

- Space commercialization
[GPO-22-870] p 70 N84-10108

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Alternative strategies for space station financing
[NASA-CR-175412] p 72 N84-21437

- Commercial Space Launch Act
[H-REPT-98-816] p 103 N84-34329

- Review of the National Aeronautics and Space Act of 1958, as amended
[GPO-39-705] p 103 N84-35134

SPACE EXPLORATION

- Should there be a mortgage convention for space activity investors?
[IAF PAPER 82-IISL-52] p 67 A84-17063

- Spinoff, 1984
[NASA-TM-85596] p 65 N84-33305

SPACE FLIGHT

- National Aeronautics and Space Administration Authorization Act, 1985 p 101 N84-21443

- National Aeronautics and Space Administration Authorization Act, 1985 p 101 N84-21444

- [H-REPT-98-629] p 101 N84-21444

SPACE INDUSTRIALIZATION

- Space insurance - Issues and problems p 96 A84-16892

- Profitability of manufacturing in space in view of lunar industrial development and geo-socio-economic benefits p 25 A84-22344

- A legal charter for non-governmental space industrialization
[AAS PAPER 83-225] p 98 A84-29868

- Emerging government regulation of American space entrepreneurs
[AAS PAPER 83-227] p 99 A84-29870

- Policy and legal issues involved in the commercialization of space p 100 N84-11069

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

- Space commercialization
[GPO-26-498] p 71 N84-17194

SPACE SHUTTLE PAYLOADS

- Alternative strategies for space station financing
[NASA-CR-175412] p 72 N84-21437
- SPACE SHUTTLES**
- Mobilization and defense management technical reports series. Management implications of industrial support capabilities for Space Shuttle operations
[AD-A137460] p 81 N84-19390
- A development of logistics management models for the Space Transportation System
[NASA-CR-173504] p 84 N84-23664
- Space Station commercial user development
[NASA-CR-173688] p 77 N84-27756
- Spinoff, 1984
[NASA-TM-85596] p 65 N84-33305
- SPACE STATIONS**
- Commercial communications satellite market and technology in the 90's
[IAF PAPER 83-86] p 66 A84-11739
- Computer-assisted engineering data base
[ASME PAPER 83-WA/AERO-11] p 32 A84-30608
- Alternative strategies for space station financing
[NASA-CR-175412] p 72 N84-21437
- Space Station commercial user development
[NASA-CR-173688] p 77 N84-27756
- SPACE TRANSPORTATION**
- Federal government regulation of commercial operations using expendable launch vehicles
p 99 A84-43365
- SPACE TRANSPORTATION SYSTEM**
- A development of logistics management models for the Space Transportation System
[NASA-CR-173504] p 84 N84-23664
- SPACECRAFT CONSTRUCTION MATERIALS**
- Air force technical objective document FY 85
[AD-A141925] p 86 N84-31033
- SPACECRAFT LAUNCHING**
- Space insurance - Issues and problems
p 96 A84-16892
- The launch and performance of spacecraft - An insurance perspective
p 97 A84-20646
- Risk management - A necessary tool for satellite owners and users
p 69 A84-34770
- Federal government regulation of commercial operations using expendable launch vehicles
p 99 A84-43365
- A development of logistics management models for the Space Transportation System
[NASA-CR-173504] p 84 N84-23664
- Commercial Space Launch Act
[H-REPT-98-816] p 103 N84-34329
- SPACECRAFT PERFORMANCE**
- Automated spacecraft health and status
[AIAA PAPER 84-0685] p 31 A84-25276
- SPACECRAFT RELIABILITY**
- Reliability programs for commercial communication satellites
p 88 A84-15209
- SPACELAB**
- The Spacelab program - The management of the program, problems encountered and the solutions adopted
p 60 A84-15325
- SPARE PARTS**
- Integrated logistic supportability (Aviation materiel)
[AD-A132367] p 79 N84-13148
- The aircraft availability model: Conceptual framework and mathematics
[AD-A132927] p 79 N84-14115
- An approach to logistic problems by the L-transform method
p 80 N84-15884
- Automated storage and retrieval systems--a consolidation of guidance for project management and implementation
[AD-A135571] p 80 N84-19175
- Mobilization and defense management technical reports series. Management implications of industrial support capabilities for Space Shuttle operations
[AD-A137460] p 81 N84-19390
- Increasing spares competition in AFLC (Air Force Logistics Center)
[AD-P002775] p 81 N84-23322
- Reshaping the philosophy of spare parts acquisition: Project PACER PRICE
[AD-P002791] p 82 N84-23338
- Central Demand Data Base (CDDB) End Item Code (EIC)
[AD-P002807] p 83 N84-23353
- Improved management of support resources
[AD-P002808] p 83 N84-23354
- Mortality and spareparts: A conceptual analysis
[AD-P002826] p 83 N84-23371
- Increasing competition for spares within AFLC (Air Force Logistics Command)
[AD-A140751] p 85 N84-27588
- AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition
[AD-A144045] p 87 N84-33366

SPECIFICATIONS

- Computer program development specification for Ada integrated environment: KAPSE (Kernel Ada Programming Support Environment)/Database, type b5, B5-AIE(1).KAPSE(1)
[AD-A134092] p 43 N84-14766
- Information needs and system specifications for the B-1B executive information system
[AD-A134424] p 45 N84-17054
- Specifications for a federal information processing standard data dictionary system
p 93 N84-21414
- An integrated approach to a successful embedded computer resource project
[AD-P003574] p 56 N84-31179
- STABILITY**
- Factor stability and construct validation of Yukl's MBS (Managerial Behavior Survey) for military leadership
[AD-P003246] p 21 N84-28413
- STANDARDIZATION**
- ANSI Ada and the UK M-CHAPSE
p 91 N84-14760
- Development of a proposed standard for the exchange of scientific microcomputer programs
[PB84-157940] p 94 N84-24244
- Improving system affordability
[AD-A142387] p 77 N84-31062
- MATE standardization
[AD-P003587] p 95 N84-31192
- I/O channel interface
[NBS-FIPS-PUB-60-2] p 57 N84-33057
- STANDARDS**
- Application of software engineering standards - A report on the state of the art
[AIAA PAPER 83-2356] p 88 A84-10026
- Issues affecting software standards to ensure quality and productivity
[AIAA PAPER 83-2358] p 88 A84-10028
- Software engineering project standards
p 90 A84-24450
- Specifications for a federal information processing standard data dictionary system
p 93 N84-21414
- Monitoring software development through dynamic variables
p 49 N84-23139
- Cost accounting standards: A time for government and industry action
[AD-P002767] p 72 N84-23314
- The new MIL-STDs (Military standard) 1388
[AD-P002806] p 82 N84-23352
- The avionics integrity program (AVIP)
[AD-P002817] p 93 N84-23362
- Standards and integrated avionic digital system architecture
[AD-P003561] p 95 N84-31166
- Defense industry attitudes about AF interface standards report of an electronics industries association survey
[AD-P003570] p 95 N84-31175
- An integrated approach to a successful embedded computer resource project
[AD-P003574] p 56 N84-31179
- STATISTICAL ANALYSIS**
- Statistical models for estimating overhead costs
[AD-A137351] p 71 N84-20444
- Proceedings of the 2nd International Workshop on Statistical Database Management
[DE84-005866] p 52 N84-25522
- Interactive risk analysis and development of standardized factors
[AD-A140758] p 77 N84-27473
- STATISTICAL DECISION THEORY**
- Risk assessment
p 12 A84-15322
- Equitable assignment rules
[AD-A142809] p 24 N84-32268
- STATISTICAL DISTRIBUTIONS**
- Reliability cost estimation - Managerial perspectives
p 66 A84-15215
- STATISTICS**
- Two-level compromise designs for estimating main effects and detecting interactions
[DE84-002997] p 16 N84-18094
- STOCHASTIC PROCESSES**
- Estimating critical path and arc probabilities in stochastic activity networks
[AD-A134255] p 16 N84-16925
- Stochastic bounds on distributions of optimal value functions with applications to PERT, network flow and reliability
[REPT-81] p 21 N84-27593
- STOCKPILING**
- Priorities for detailed quality assessments of the National Defense Stockpile nonfuel materials
[NMAB-403] p 93 N84-23011
- STORAGE**
- Priorities for detailed quality assessments of the National Defense Stockpile nonfuel materials
[NMAB-403] p 93 N84-23011

STRATEGY

- Managing program risk: One way to reduce cost growth
[AD-P002754] p 72 N84-23301
- DECISION TECHNOLOGY:** The catalyst for acquisition improvement
[AD-P002755] p 18 N84-23302
- Designing the equitable risk contract
[AD-P002756] p 81 N84-23303
- Assumption of risk in the R and D environment
[AD-P002757] p 72 N84-23304
- An analysis of the acquisition strategy decision process along three dimensions of the acquisition improvement program
[AD-P002758] p 18 N84-23305
- STRESS (PSYCHOLOGY)**
- Significance of allowing for individual differences in organizing the work shift in monotonous production work
p 2 A84-32353
- Psychological and biochemical effects of a stress management program
[AD-P003300] p 7 N84-28447
- STRUCTURAL ENGINEERING**
- Computer simulation of construction operations
p 28 N84-14704
- STUDENTS**
- Evaluation of the BCT (Basic Cadet Training) paraprofessional counselor training at the United States Air Force Academy
[AD-P003244] p 7 N84-28411
- SUPERCOMPUTERS**
- Computer research in Japan
p 39 A84-31347
- SUPPORT SYSTEMS**
- Program Manager's Support System (PMSS): An update
[AD-P002825] p 50 N84-23370
- SURVEYS**
- Training feedback handbook
[AD-A132565] p 2 N84-14683
- An investigation of organizational climate: Definition, measurement, and usefulness as a diagnostic technique
p 21 N84-27595
- Defense industry attitudes about AF interface standards report of an electronics industries association survey
[AD-P003570] p 95 N84-31175
- SYSTEM EFFECTIVENESS**
- An evaluation of the effectiveness of project control systems
p 61 A84-42621
- The effectiveness of project managers - Implications of a political model of influence
p 14 A84-42622
- Configuration control methodology for system performance enhancement
[AIAA PAPER 84-1942] p 14 A84-43469
- Use of scientific potential in industry discussions
p 26 N84-10353
- Integrated logistic supportability (Aviation materiel)
[AD-A132367] p 79 N84-13146
- System engineering management guide
[AD-A136020] p 16 N84-19129
- A set of organizational-climate measures: Internal consistency, factor structure, and predictive power
[AD-A135352] p 16 N84-19132
- Methodology for benefit analysis of CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) in USN shipyards
[AD-A138398] p 34 N84-22270
- The acquisition management information system: Friend or foe?
[AD-P002751] p 50 N84-23298
- Large firm efficiency, concentration, and profitability in defense markets
[AD-P002810] p 75 N84-23356
- Defense systems acquisition review process: A history and evaluation
[AD-P002822] p 64 N84-23367
- Improving the effectiveness of award fee contracts for program management support services
[AD-P002827] p 75 N84-23372
- A survey of contractor productivity measurement practices
[AD-P002831] p 76 N84-23376
- The Score technique: An analytical approach for assessing the results of manufacturing reviews
[AD-P002838] p 30 N84-23383
- Technical and economic indicators for industrial technological institutes
p 76 N84-23392
- An overview of productivity improvement efforts in Army organizations
[AD-A138589] p 19 N84-24490
- A guide to macro and micro computer performance evaluation
[AD-A140127] p 51 N84-25329
- AN/TPN-19 improvements program management plan
[AD-A140728] p 84 N84-26690
- Control systems
[AD-A140901] p 21 N84-27592

- Environments for evaluating performance of C3I (Command, Control, Communications, and Intelligence) systems
[AD-P003237] p 21 N84-28404
- Determining cost and training effectiveness tradeoffs for trainer design: Test of an experimental model
[AD-P003455] p 10 N84-32232
- An evaluation of the system 2000 data base management system for use in major item system mapping
[DE84-013130] p 87 N84-32296
- SYSTEMS ANALYSIS**
- The multiobjective multistage impact analysis method
Theoretical basis p 14 A84-33465
- Reliability programs for nonelectronic designs, volume 2
[AD-A133625] p 91 N84-14528
- Information needs and system specifications for the B-1B executive information system
[AD-A134424] p 45 N84-17054
- An approach to the design of a management information system: Development procedure for the Indonesian defense logistics staff
[AD-A134974] p 80 N84-18108
- Methodology for benefit analysis of CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) in USN shipyards
[AD-A138398] p 34 N84-22270
- Mortality and spareparts: A conceptual analysis
[AD-P002826] p 83 N84-23371
- Project management in the 80's
[MBB-UR-631-83-O] p 65 N84-26454
- Study of the FAA (Federal Aviation Administration) program to modernize maintenance operations
[AD-A142295] p 86 N84-29848
- A field study of Air Force organization structures
[AD-A142389] p 23 N84-31035
- Microcomputers in transportation: Software and source book
[PB84-195155] p 87 N84-33067
- Workshop on Systems Analysis
[PB84-194661] p 24 N84-33138
- SYSTEMS COMPATIBILITY**
- Development of a proposed standard for the exchange of scientific microcomputer programs
[PB84-157940] p 94 N84-24244
- Logistic support: A computer manufacturer's viewpoint
[AD-P003498] p 87 N84-32262
- SYSTEMS ENGINEERING**
- DMS - A system for defining and managing human-computer dialogues p 1 A84-21640
- A total system design framework p 39 A84-41201
- Tools for the creation of IMS database designs from Entity-Relationship diagrams
[DE84-000592] p 42 N84-14086
- Recommended test and evaluation and independent verification and validation actions for the Defense Data Network
[AD-A134167] p 44 N84-17049
- System engineering management guide
[AD-A136020] p 16 N84-19129
- Knowledge-based support systems for long range planning
[AD-A137311] p 17 N84-20424
- Requirements analysis for forward funding tracking system, volume 1
[AD-A136840] p 46 N84-20425
- Automated RTOP management system
[AD-A136840] p 47 N84-21406
- Program Manager's Support System (PMSS): An update
[AD-P002825] p 50 N84-23370
- Saab claims world's most modern engine-assembly plant p 34 N84-23800
- Quality control in large systems development phase
[SNIAS-832-422-102] p 94 N84-25074
- Unified database development program
[AD-A140309] p 52 N84-26471
- Microcomputers in transportation: Software and source book
[PB84-195155] p 87 N84-33067
- SYSTEMS INTEGRATION**
- Integrated management in matrix organization
[AD-A136840] p 13 A84-23989
- Proceedings of the 1982 Integrated Data Users Workshop
[DE83-014761] p 40 N84-11066
- Technical and economic analysis of the planned visual display terminal employment for the Stock Point Logistics Integrated Communications Environment (SPLICE)
[AD-A133642] p 80 N84-14711
- Computer program development specification for Ada integrated environment: KAPSE (Kernel Ada Programming Support Environment)/Database, type b5, B5-AIE(1), KAPSE(1)
[AD-A134092] p 43 N84-14766
- The dynamics of software development project management: An integrative systems dynamic perspective
[NASA-CR-175342] p 44 N84-16824
- Integrated Computer-Aided Manufacturing (ICAM) architecture part 3. Volume 1: Architecture part 3: Accomplishments
[AD-A134249] p 33 N84-16829
- Recommended test and evaluation and independent verification and validation actions for the Defense Data Network
[AD-A134167] p 44 N84-17049
- Development of a proposed standard for the exchange of scientific microcomputer programs
[PB84-157940] p 94 N84-24244
- Quality control in large systems development phase
[SNIAS-832-422-102] p 94 N84-25074
- Standards and integrated avionic digital system architecture
[AD-P003561] p 95 N84-31166
- Interactive information environments: A plan for enabling interdisciplinary research
[RAND/N-2115] p 58 N84-33284
- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 7: MFG01 glossary
[AD-A144426] p 36 N84-34991
- SYSTEMS MANAGEMENT**
- Analogy in systems management - A theoretical inquiry p 13 A84-25008
- Automated spacecraft health and status
[AIAA PAPER 84-0685] p 31 A84-25276
- Software control and system configuration management - A process that works p 38 A84-26713
- The multiobjective multistage impact analysis method
Theoretical basis p 14 A84-33465
- Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text p 39 A84-44325
- A method for designing computer support documentation
[AD-A134466] p 44 N84-16831
- System engineering management guide
[AD-A136020] p 16 N84-19129
- Program Manager's Support System (PMSS): An update
[AD-P002825] p 50 N84-23370
- Computer science and technology: Selection of microcomputer systems
[PB84-167725] p 51 N84-25331
- LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 2
[AD-A141397] p 54 N84-29787
- Software control and system configuration management: A systems-wide approach
[NASA-TM-85908] p 56 N84-31112
- Analysis of modern analog and digital communication channels from a manager's perspective
[AD-A143161] p 57 N84-31494
- An evaluation of the system 2000 data base management system for use in major item system mapping
[DE84-013130] p 87 N84-32296
- Decision-making process in management automation
[AD-A136840] p 25 N84-34644
- SYSTEMS SIMULATION**
- Building an information model (with the help of PSL/PSA) - Problem Statement Language/Problem Statement Analyzer
[AIAA PAPER 83-2329] p 37 A84-10011
- Reliability cost estimation - Managerial perspectives
[AD-A136840] p 66 A84-15215
- Modeling and analysis of teams of interacting decisionmakers with bounded rationality
[AD-A136840] p 13 A84-21644
- Airline Maintenance Management System (AMMS)
[AD-A136840] p 79 A84-46582
- T**
- TABULATION PROCESSES**
- Designing readable and reusable tables
[RAND/P-6945] p 51 N84-24496
- TASK COMPLEXITY**
- The NASA Software Management and Assurance Program
[AIAA PAPER 83-2336] p 37 A84-10015
- Development and application of a criterion task set for workload metric evaluation
[SAE PAPER 831419] p 1 A84-29482
- The structure of processing resource demands in monitoring automatic systems
[AD-P003319] p 8 N84-28455
- TASKS**
- Organizational-climate dimensions: A conceptual and judgmental analysis
[AD-A132898] p 15 N84-16068
- A normative model of work team effectiveness
[AD-A136398] p 17 N84-20165
- The effects of task variability, sensory reinforcement, and monetary reinforcement on performance, satisfaction, and intrinsic motivation p 7 N84-27584
- Safety training priorities
[AD-A141711] p 95 N84-29026
- A multiple processing resource explanation of the subjective dimensions of operator workload
[AD-A141455] p 9 N84-29480
- TEAMS**
- Modeling and analysis of teams of interacting decisionmakers with bounded rationality
[AD-A136398] p 13 A84-21644
- A study of temporary task teams - team spirit development in solving complex technical problems or preparing engineering studies p 2 A84-31212
- A normative model of work team effectiveness
[AD-A136398] p 17 N84-20165
- TECHNICAL WRITING**
- Preferences on technical report format - Results of a survey p 39 A84-33153
- The function of report components in the screening and reading of technical reports p 40 A84-45547
- Report format preferences of technical managers and nonmanagers p 40 A84-45572
- Designing readable and reusable tables
[RAND/P-6945] p 51 N84-24496
- TECHNOLOGICAL FORECASTING**
- Commercial communications satellite market and technology in the 90's
[IAF PAPER 83-86] p 66 A84-11739
- Japan's next generation of robots p 32 A84-31346
- Use of economic mechanisms in managing scientific and technical progress p 76 N84-23389
- Future of aeronautics
[GPO-29-744] p 30 N84-25529
- Impact of robots and computers on the work force of the 1980's
[GPO-31-912] p 36 N84-32826
- TECHNOLOGIES**
- Role of technology in promoting industrial competitiveness
[S-REPT-98-565] p 29 N84-19605
- Behavioral issues in the management of technology
[AD-P003349] p 9 N84-28467
- TECHNOLOGY ASSESSMENT**
- Application of software engineering standards - A report on the state of the art
[AIAA PAPER 83-2356] p 88 A84-10026
- Some technical and contractual aspects of transponder leasing by EUTELSAT p 79 A84-20645
- Advances in manufacturing technology
[AD-A136840] p 31 A84-28014
- Computer research in Japan p 39 A84-31347
- The technical and economic considerations of bringing satellite communications to small mobile users
[AD-A136840] p 69 A84-37900
- The O'Hare Runway Configuration Management System p 79 A84-44732
- Computer science and technology: Microcomputer: A review of federal agency experiences
[PB83-238972] p 41 N84-11772
- Technical and economic indicators for industrial technological institutes p 76 N84-23392
- Prerequisites for scientific-technical progress enumerated p 50 N84-23395
- Appropriate Technology Small Grants Program evaluation, volume 1: Executive summary
[DE84-010675] p 102 N84-31038
- National Airspace Review: Implementation plan
[AD-A145379] p 86 N84-31107
- Parts on demand: Evaluation of approaches to achieve flexible manufacturing systems for Navy parts on demand, volume 1
[AD-A143248] p 31 N84-32830
- TECHNOLOGY TRANSFER**
- Timely application of advanced human factors test and evaluation techniques during the acquisition of new Air Force systems p 1 A84-19308
- 'Reverse' transfers of technology from overseas subsidiaries to American firms p 61 A84-42620
- New opportunities for the private sector in space technology p 69 A84-49145
- Trade agreements on know-how discussed p 70 N84-10349
- Measures to step up practical use of scientific work discussed p 26 N84-10350

- Use of scientific potential in industry discusses p 26 N84-10353
- Scientist discusses problems in introducing new technology p 62 N84-10357
- The socialist and developing countries: Technology transfer p 62 N84-11035
- Organizational improvements in CEMA scientific, technical cooperation sought p 62 N84-11039
- Lack of support for introduction of Soviet inventions scored p 62 N84-11042
- Applications of academic research neglected by industry p 62 N84-11044
- Joint industry/university cooperation with federally supported research facilities [GPO-24-902] p 100 N84-18115
- Manufacturing information system [AD-A137891] p 33 N84-20730
- Management of aerospace contract documentation by industry and government [DE84-900451] p 47 N84-21396
- ORNL trends and balances, 1984-1989 [DE84-006320] p 63 N84-21397
- The government relationship to industry in technology transfer and development [AD-P002772] p 29 N84-23319
- Problems of prompt adoption of new technology discussed p 50 N84-23396
- Technology transfer [H-REPT-98-15] p 65 N84-25528
- Technology transfer revisited [DE84-012233] p 65 N84-32293
- Interactive information environments: A plan for enabling interdisciplinary research [RAND/N-2115] p 58 N84-33284
- Scientific and technical information transfer: Issues and options [RAND/N-2131-NSF] p 65 N84-33286
- TECHNOLOGY UTILIZATION**
- Planning the use of robots p 32 A84-42760
- Site computers p 28 N84-14701
- Computers for the smaller contractors p 28 N84-14703
- Further delineation of the utilization of scientific literature by U.S. patents [PB84-100734] p 100 N84-18095
- Incentives for new production discussed p 102 N84-23388
- Impact of Latvian Robotics Institute on industry modernization p 35 N84-24110
- Technology transfer [H-REPT-98-15] p 65 N84-25528
- Microcomputers: Introduction to features and uses [PB84-178821] p 53 N84-27456
- Computer-automated technological innovation in three manufacturing sectors [AD-P003309] p 35 N84-28450
- Text processing in the writing of contracts [SNIAS-841-422-102] p 65 N84-32297
- A user view of office automation or the integrated workstation p 58 N84-33271
- Commercial Space Launch Act [H-REPT-98-816] p 103 N84-34329
- TELECOMMUNICATION**
- Technical and economic analysis of the planned visual display terminal employment for the Stock Point Logistics Integrated Communications Environment (SPLICE) [AD-A133642] p 80 N84-14711
- Report on U.S. domestic and international telecommunications and information markets [PB84-166362] p 77 N84-27602
- Environments for evaluating performance of C3I (Command, Control, Communications, and Intelligence) systems [AD-P003237] p 21 N84-28404
- Analysis of modern analog and digital communication channels from a manager's perspective [AD-A143161] p 57 N84-31494
- The role of information technology in emergency management [GPO-29-457] p 103 N84-34319
- TELECONFERENCING**
- Office automation: A look beyond word processing [AD-A132764] p 53 N84-28670
- TELEOPERATORS**
- Japan's next generation of robots p 32 A84-31346
- NOSC (Naval Ocean Systems Center)-Hawaii perceptual sciences research program [AD-P003361] p 9 N84-28474
- TELEPHONES**
- An exploratory study of the use of an inexpensive cordless telephone as a part of a data communications link -- management information in hospitals [AD-A134228] p 44 N84-16432

TERMINAL CONFIGURED VEHICLE PROGRAM

- The NASA Software Management and Assurance Program [AIAA PAPER 83-2336] p 37 A84-10015

TEST EQUIPMENT

- General Purpose Electronic Test Equipment (GPETE) acquisition considerations for automated calibration [AD-A133865] p 91 N84-14709

TEST RANGES

- Universal documentation system handbook - an introduction to the universal documentation system [AD-A140140] p 52 N84-25742

TESTING TIME

- Managing test-procedures to achieve reliable software p 89 A84-15219

TEXTS

- Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text p 39 A84-44325
- Text processing in the writing of contracts [SNIAS-841-422-102] p 65 N84-32297

TIME

- Space Station commercial user development [NASA-CR-173688] p 77 N84-27756

TIME SHARING

- Manual for implementing a Shared Time Engineering Program (STEP) September 1980 through September 1983 [PB84-144260] p 29 N84-21765

TRADEOFFS

- Engineering tradeoff problems viewed as multiple objective optimizations and the VODCA methodology p 13 A84-31213
- Determining cost and training effectiveness tradeoffs for trainer design: Test of an experimental model [AD-P003455] p 10 N84-32232

TRAINING ANALYSIS

- Evaluation results for the interactive video competency recognition system [AD-A133052] p 2 N84-15796
- An introduction to human factors for engineering managers: Framework for a teaching unit [AD-A135958] p 4 N84-20428
- Safety training priorities p 95 N84-29026
- Ada (Trademark) training considerations [AD-P003560] p 10 N84-31164
- An analysis of the effectiveness of the problem solving skills for managers training package-USCG [AD-A144017] p 12 N84-34317

TRAINING DEVICES

- Research issues in training device design: The organization of a data base p 6 N84-26710
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers' guide: Volume 1 [AD-A142430] p 10 N84-30768
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers' guide: Volume 2 [AD-A142431] p 10 N84-30769
- Ada (Registered trademark) training curriculum. Software engineering for managers. M101: Teachers' guide [AD-A142432] p 10 N84-30770
- Concurrency of design criteria: A key to trainer readiness [AD-P003454] p 10 N84-32231
- Determining cost and training effectiveness tradeoffs for trainer design: Test of an experimental model [AD-P003455] p 10 N84-32232
- Training capabilities: The facility part of the equation [AD-P003457] p 11 N84-32234
- Effectiveness of multi-year and advance procurement contracts [AD-P003462] p 86 N84-32239
- Managing aircraft/simulator concurrency [AD-P003463] p 86 N84-32240
- Managing a low quantity, high technology trainer development program [AD-P003464] p 11 N84-32241
- Some management initiatives to improve embedded commercial computer and training device life cycle support [AD-P003494] p 11 N84-32260

TRAINING EVALUATION

- A review of major issues relating to human-machine integration in the development of military systems [AD-A136739] p 3 N84-20184
- Evaluation of the BCT (Basic Cadet Training) paraprofessional counselor training at the United States Air Force Academy [AD-P003244] p 7 N84-28411

- Proceedings of the 5th Interservice-Industry Training Equipment Conference, volume 2 [AD-A142775] p 11 N84-32266

TRAINING SIMULATORS

- Profit responsibilities in the simulation and training equipment industry [AD-P003497] p 77 N84-32263

TRANSMISSION EFFICIENCY

- An exploratory study of the use of an inexpensive cordless telephone as a part of a data communications link -- management information in hospitals [AD-A134228] p 44 N84-16432

TRANSPONDERS

- Some technical and contractual aspects of transponder leasing by EUTELSAT p 79 A84-20645

TRANSPORT AIRCRAFT

- Analysis of the influence of the load factor in planning aircraft transport capacity p 68 A84-25192

TRANSPORTATION

- Microcomputers in transportation: Software and source book [PB84-195155] p 87 N84-33067

TRENDS

- ORNL trends and balances, 1984-1989 [DE84-006320] p 63 N84-21397

U**U.S.S.R.**

- The socialist and developing countries: Technology transfer p 62 N84-11035
- Organizational improvements in CEMA scientific, technical cooperation sought p 62 N84-11039
- Lack of support for introduction of Soviet inventions scored p 62 N84-11042
- Sixth all-union congress of inventors held p 62 N84-11043
- Applications of academic research neglected by industry p 62 N84-11044

UNITED KINGDOM

- Aircraft accident enquiries - Whose interest prevails? p 98 A84-27412

UNITED STATES

- Legal status of memoranda of understanding in the United States p 99 A84-38475

UNIVERSITIES

- Joint industry/university cooperation with federally supported research facilities [GPO-24-902] p 100 N84-18115
- Manufacturing information system [AD-A137891] p 33 N84-20730
- Training acquisition personnel through a local college [AD-P002766] p 6 N84-23313
- A study of the extent of automation in small college libraries and relationships of attitudes of library directors toward it p 58 N84-33260

UNIVERSITY PROGRAM

- Computer research in Japan p 39 A84-31347
- Strengthening the government-university partnership in science [PB83-230870] p 100 N84-11979

URBAN TRANSPORTATION

- Workshop on Systems Analysis [PB84-194661] p 24 N84-33138
- Scenario planning: Energy considerations in the long range urban transportation planning process [DE84-013590] p 87 N84-33308

USER MANUALS (COMPUTER PROGRAMS)

- Methods for improving the user-computer interface [AD-A132657] p 2 N84-14713
- A method for designing computer support documentation [AD-A134466] p 44 N84-16831
- RIM as an implementation tool for a distributed heterogeneous database p 48 N84-22311
- Automated Construction Management System (ACMS). Volume 1: User's guide [AD-A143031] p 30 N84-31971

USER REQUIREMENTS

- Application of software engineering standards - A report on the state of the art [AIAA PAPER 83-2356] p 88 A84-10026
- The function of report components in the screening and reading of technical reports p 40 A84-45547
- Computer system design environment software development plan [AD-A131651] p 41 N84-12747
- Methods for improving the user-computer interface [AD-A132657] p 2 N84-14713
- Ada and the NASA software environment p 43 N84-14749
- Modeling the user in intelligent user interfaces [DE84-012664] p 2 N84-14795

- The determination of user information requirements during the development of management information systems
[AD-A132998] p 43 N84-14980
- A method for designing computer support documentation
[AD-A134466] p 44 N84-16831
- Data organisations and their management
p 45 N84-17069
- Guide to the development of a human factors engineering data retrieval system
[AD-A136918] p 4 N84-20187
- Corporate DP planning: New approaches and new concerns --- data processing (DP)
[PNR-90180] p 50 N84-23386
- Computer science and technology: Selection of microcomputer systems
[PB84-167725] p 51 N84-25331
- A knowledge-based system for LP (Linear Programming) modeling
[AD-A139991] p 35 N84-25357
- An analysis of naval aviation configuration status accounting
[AD-A140473] p 84 N84-26460
- The ROE file system
[AD-A140497] p 52 N84-26473
- Development of Integrated Programs for Aerospace-vehicle Design (IPAD). IPAD user requirements: Implementation (first-level IPAD)
[NASA-CR-162713] p 30 N84-28776
- Automated Construction Management System (ACMS). Volume 2: Program documentation
[AD-A143032] p 30 N84-31972
- UTILIZATION**
- Important CAD/CAM utilization at MBB
[MBB-Z-13-83-O] p 35 N84-26451

V

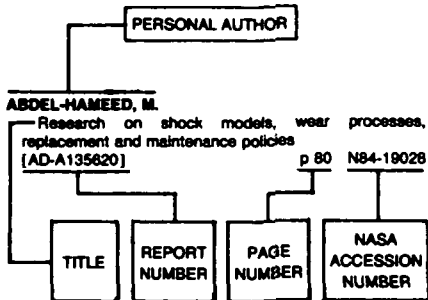
- VALUE**
- Value and competition
[SNIAS-832-501-101] p 76 N84-25504
- VALUE ENGINEERING**
- The 'Value Analysis' tool
p 67 A84-15320
- VERBAL COMMUNICATION**
- DMS - A system for defining and managing human-computer dialogues
p 1 A84-21640
- VERY LARGE SCALE INTEGRATION**
- R&D and quality assurance partnership
p 90 A84-15597
- VIDEO DATA**
- Video games: A human factors guide to visual display design and instructional system design
[AD-P003368] p 9 N84-28480
- VISUAL AIDS**
- Computer-assisted information graphics from the graphic design perspective
[DE84-006059] p 48 N84-22281
- A system for embedding data displays in graphical contexts
[AD-A143630] p 24 N84-34191
- VULNERABILITY**
- Software quality measurement for distributed systems. Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129
- Information systems, security and privacy
[RAND/P-6930] p 47 N84-21402

W

- WARNING SYSTEMS**
- System safety in aircraft acquisition
[AD-A141492] p 95 N84-28763
- WASTE TREATMENT**
- Workshop on Systems Analysis
[PB84-194661] p 24 N84-33138
- WEAPON SYSTEMS**
- Software performance modeling and management
p 89 A84-15218
- Timely application of advanced human factors test and evaluation techniques during the acquisition of new Air Force systems
p 1 A84-19308
- Management of risk and uncertainty in systems acquisition: Proceedings of the 1983 Defense Risk and Uncertainty Workshop
[AD-A136230] p 16 N84-19124
- System engineering management guide
[AD-A136020] p 16 N84-19129
- A review of major issues relating to human-machine integration in the development of military systems
[AD-A136739] p 3 N84-20184
- DECISION TECHNOLOGY: The catalyst for acquisition improvement**
[AD-P002755] p 18 N84-23302

- Computer Generated Acquisition Document System (CGADS)
[AD-P002784] p 50 N84-23331
- An automated airframe production cost model
[AD-P002787] p 74 N84-23334
- Improved management of support resources
[AD-P002808] p 83 N84-23354
- Quality assurance - Air Force Logistics Command
[AD-P002816] p 93 N84-23361
- Selection of multiple sources in weapon systems acquisition
[AD-P002837] p 84 N84-23382
- Unified database development program
[AD-A140309] p 52 N84-26471
- Improving system affordability
[AD-A142387] p 77 N84-31062
- Standards and integrated avionics digital system architecture
[AD-P003561] p 95 N84-31166
- MATE standardization
[AD-P003587] p 95 N84-31192
- An evaluation of two reliability and maintainability information systems
[AD-A143438] p 87 N84-33290
- WEAPONS**
- Data base management of software development
[AD-P003486] p 57 N84-32253
- WEAPONS INDUSTRY**
- Selection of multiple sources in weapon systems acquisition
[AD-P002837] p 84 N84-23382
- WEIGHTING FUNCTIONS**
- Equal weights, flat maxima, and trivial decisions
[AD-A138506] p 18 N84-22342
- WORD PROCESSING**
- Office automation: A look beyond word processing
[AD-A132764] p 53 N84-28670
- Text processing in the writing of contracts
[SNIAS-841-422-102] p 65 N84-32297
- WORK**
- Biological clocks and shift work scheduling
[GPO-21-747] p 2 N84-12713
- Motivation and work performance: A comparative and analytical study
p 6 N84-27441
- Equitable assignment rules
[AD-A142809] p 24 N84-32268
- WORK CAPACITY**
- Significance of allowing for individual differences in organizing the work shift in monotonous production work
p 2 A84-32353
- WORK-REST CYCLE**
- Significance of allowing for individual differences in organizing the work shift in monotonous production work
p 2 A84-32353
- WORKLOADS (PSYCHOPHYSIOLOGY)**
- Development and application of a criterion task set for workload metric evaluation
[SAE PAPER 831419] p 1 A84-29482
- Assessing contracting workforce requirements in the matrixed organization
[AD-P002760] p 5 N84-23307
- Physical performance tests as predictors of task performance
[AD-P003257] p 7 N84-28424
- The structure of processing resource demands in monitoring automatic systems
[AD-P003319] p 8 N84-28455
- A multiple processing resource explanation of the subjective dimensions of operator workload
[AD-A141455] p 9 N84-29480

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document listed (e.g., NASA report, translation, NASA contractor report). The page and accession numbers are located beneath and to the right of the title. Under any one author's name the accession numbers are arranged in sequence with the AIAA accession numbers appearing first.

A

- ABDEL-HAMEED, M.**
Research on shock models, wear processes, replacement and maintenance policies
[AD-A135620] p 80 N84-19028
- ABDEL-HAMID, T.**
The dynamics of software development project management: An integrative systems dynamic perspective
[NASA-CR-175342] p 44 N84-16824
- ABELL, J. B.**
A development of logistics management models for the Space Transportation System
[NASA-CR-173504] p 84 N84-23664
- ABEYTA, R. D.**
Management of risk and uncertainty in systems acquisition: Proceedings of the 1983 Defense Risk and Uncertainty Workshop
[AD-A136230] p 16 N84-19124
- ACKER, D. D.**
Defense systems acquisition review process: A history and evaluation
[AD-P002822] p 64 N84-23367
- ACTON, W. H.**
Development and application of a criterion task set for workload metric evaluation
[SAE PAPER 831419] p 1 A84-29482
- ADLER, F. L.**
A concept for mission-oriented planning for system acquisition at the Defense Communications Agency
[AD-P002823] p 19 N84-23368
- AGRESTI, W.**
Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150
- ALBINI, J. C.**
Quality at the crossroads
[AD-P002818] p 93 N84-23363
- ALDERFER, C. P.**
An intergroup perspective on group dynamics
[AD-A135582] p 17 N84-20167
- ALLEN, D. K.**
Manufacturing information system
[AD-A137891] p 33 N84-20730

- ALLEN, G. L.**
Assessment of learning abilities using rate measures
[AD-P003340] p 8 N84-28463
- ALLEN, R. F.**
Large firm efficiency, concentration, and profitability in defense markets
[AD-P002810] p 75 N84-23356
- AMALRIC, C.**
Commentary on Philips R and D strategy, policies, major efforts
p 66 N84-34647
- ANDERSON, A. J. W.**
Reliability in space: Program manager and user awareness
[AD-P002148] p 94 N84-23813
- ANSON, P.**
The technical and economic considerations of bringing satellite communications to small mobile users
p 69 A84-37900
- APPUHN, R. A.**
Integrated bid estimate systems for contractors
p 70 N84-14699
- ARCIERI, J. D.**
Policy initiatives to achieve readiness and support objectives
[AD-P002804] p 82 N84-23350
- ARGOTE, L.**
The human side of robotics: Results from a prototype study on how workers react to a robot
[AD-A133438] p 33 N84-15805
- ARLOTTO, J. J.**
Information retrieval research support
[AD-A131990] p 41 N84-13022
- ARNETT, J. C.**
Qualification testing and electrical measurement experience: A manufacturer's view
p 96 N84-32705
- ARONOFF, H. I.**
Manual for implementing a Shared Time Engineering Program (STEP) September 1980 through September 1983
[PB84-144260] p 29 N84-21765
- ASH, P. R.**
An investigation of organizational climate: Definition, measurement, and usefulness as a diagnostic technique
p 21 N84-27595
- ASKREN, W. B.**
Human factors products: A one-act play with epilogue
[AD-A133354] p 3 N84-16811
- ASSELIN, A. S.**
A multi-period repair parts inventory model for a naval air rework facility
[AD-A136873] p 81 N84-19280
- AUSTIN, J. S.**
A field study of Air Force organization structures
[AD-A142389] p 23 N84-31035
- AVANT, R.**
Evaluation results for the interactive video competency recognition system
[AD-A133052] p 2 N84-15796
- AVIS, B. E.**
A host-target programming support environment for the production of high-quality real-time systems
p 43 N84-14753

B

- BAILEY, E. E.**
Deregulating the airlines: An economic analysis
[PB83-250019] p 100 N84-14070
- BAIRD, C. B.**
A concept for mission-oriented planning for system acquisition at the Defense Communications Agency
[AD-P002823] p 19 N84-23368
- BALACHANDRA, R.**
Factors explaining decisions to terminate or continue an R and D project, executive summary
[PB83-256602] p 63 N84-14971
- BALAGEZYAN, D.**
Research in man-machine interaction discussed
p 6 N84-23393
- BALAS, E.**
Disjunctive programming and a hierarchy of relaxations for discrete optimization problems
[AD-A132004] p 15 N84-12784
- BALL, W. E.**
On the facial structure of scheduling polyhedra
[AD-A136983] p 17 N84-20427
- BALUT, S. J.**
A total system design framework
p 39 A84-41201
- BANGS, T. L.**
US military aircraft cost handbook
[AD-A136035] p 71 N84-18158
- BARKLEY, J.**
Toward an interpersonal paradigm for superior-subordinate communication
[AD-A135863] p 17 N84-20166
- BARNES-FARRELL, J. L.**
Computer science and technology: Selection of microcomputer systems
[PB84-167725] p 51 N84-25331
- BARNES, J. G. P.**
Personnel technology: Performance appraisal, a process approach
[AD-A138359] p 4 N84-23112
- BARRON, F. H.**
ANSI Ada and the UK M-CHAPSE
p 91 N84-14760
- BARRY, J. M.**
Equal weights, flat maxima, and trivial decisions
[AD-A138506] p 18 N84-22342
- BASAR, T.**
Office automation in the acquisition environment
[AD-P002747] p 49 N84-23294
- BASILI, V. R.**
Automating the source selection process
[AD-P002835] p 84 N84-23380
- BASAR, T.**
Incentive Stackelberg strategies for deterministic multi-stage decision processes
p 13 A84-19141
- BASILI, V. R.**
A methodology for collecting valid software engineering data
[AD-A131332] p 41 N84-11781
- BAUER, C. A.**
Monitoring software development through dynamic variables
p 49 N84-23139
- BAUMGARTNER, J. S.**
Project management techniques for highly integrated programs
[NASA-TM-86023] p 63 N84-14965
- BEARD, R. E., JR.**
Cost/schedule controls on major U.S. defense projects
[AD-P002789] p 67 A84-15323
- BECK, R. W.**
Managing for success in defense systems acquisition
[AD-P002789] p 64 N84-23336
- BECK, R. W.**
A method for designing computer support documentation
[AD-A134466] p 44 N84-16831
- BEEBE, J. L.**
Development of a document preparation staff within an office automation environment
[DE84-008649] p 55 N84-31041
- BECK, R. W.**
Managing aircraft/simulator concurrency
[AD-P003463] p 86 N84-32240
- BECKER, S.**
Computer generation of plan of action and milestone schedule
[AD-A137057] p 46 N84-20244
- BEEBE, J. L.**
Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 7: MFG01 glossary
[AD-A144426] p 36 N84-34991
- BELL, J. R.**
Patent guidelines for research managers
p 99 A84-42618
- BELYEA, F. S.**
Effectiveness of multi-year and advance procurement contracts
[AD-P003462] p 86 N84-32239

BENTON, C.

Airspace management can be improved
p 78 A84-12185

BERGMARK, U.

Saab claims world's most modern engine-assembly plant
p 34 N84-23800

BERLINER, Y.

Technical and economic indicators for industrial technological institutes
p 76 N84-23392

BERNARD, J.

Text processing in the writing of contracts
[SNIAS-841-422-102] p 65 N84-32297

BERNIER, L.

Planning the use of robots
p 32 A84-42760

BERNSTEIN, A. J.

Computer networks without a shared memory
AFOSR-81-0197
[AD-A135074] p 45 N84-17927

BERNSTEIN, S. L.

NU - A network monitoring, control, and management system
p 40 A84-49262

BEST, P.

Evaluation results for the interactive video competency recognition system
[AD-A133052] p 2 N84-15796

BETELLE, R. H.

Engineering aspects of international cooperation in aeronautics
p 26 A84-44927

BETTIN, P. J.

The role of relevant experience and intellectual ability in determining the performance of military leaders: A contingency model explanation
[AD-P003303] p 22 N84-28448

BETTS, T. K.

Automated storage and retrieval systems--a consolidation of guidance for project management and implementation
[AD-A135571] p 80 N84-19175

BEVERLY, J. G.

The make or buy decision--its nature and impact
[AD-P002779] p 82 N84-23326
Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381
Evaluating the availability, role, and performance of subcontractors in the aerospace industry
[AD-A141408] p 85 N84-29788

BEWLEY, T.

Fiscal and monetary policy in a general equilibrium model
[AD-A138502] p 72 N84-22510

BHAMBRI, A.

Organizational structures, processes, and problems: A literature review and taxonomy
[AD-A140979] p 23 N84-28665

BIAMONTI, G.

AMIX: An automated system for handling error notification data
p 91 N84-14734

BIKSON, T. K.

Interactive information environments: A plan for enabling interdisciplinary research
[RAND/N-2115] p 58 N84-33284
Scientific and technical information transfer: Issues and options
[RAND/N-2131-NSF] p 65 N84-33286

BITRAN, G. R.

Worst case performance of some heuristics for lot size problems
[INPE-3134-PRE/525] p 78 N84-34205

BLANCHARD, R. E.

Guide to the development of a human factors engineering data retrieval system
[AD-A136918] p 4 N84-20187

BOBKO, D. J.

Video games: A human factors guide to visual display design and instructional system design
[AD-P003368] p 9 N84-28480

BOCK, L. K.

An evaluation of two reliability and maintainability information systems
[AD-A143438] p 87 N84-33290

BOECKSTIEGEL, K. H.

The law applicable to contracts on space activities
[IAF PAPER 82-IISL-39] p 96 A84-17055

BOEHM, B. W.

Software engineering economics
p 68 A84-24448

BOETTCHER, K. L.

Modeling and analysis of teams of interacting decisionmakers with bounded rationality
p 13 A84-21644

BOGDANOWICZ, R. A.

Benchmarking the selection and projection operations and ordering capabilities of relational database machines
[AD-A136776] p 46 N84-20438

BOGER, D. C.

Statistical models for estimating overhead costs
[AD-A137351] p 71 N84-20444

BOIKO, V. V.

Conflicts among employees and ways of resolving them
p 1 A84-14980

BONELLO, F. J.

The make or buy decision--its nature and impact
[AD-P002779] p 82 N84-23326
Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381

Evaluating the availability, role, and performance of subcontractors in the aerospace industry
[AD-A141408] p 85 N84-29788

BONO, T. L.

Mechanized contract document preparation and abstract system
[AD-P002750] p 49 N84-23297

BOORSTYN, R.

Research in network management techniques for tactical data communications networks
[AD-A131357] p 40 N84-11365

BORDER, R. A.

Computerized plant control system
p 27 N84-14698

BORTZ, A. B.

Workshop on Magnetic Information Technology (MINT)
[PB84-125210] p 45 N84-18619

BOUILLET, J.

The industrial just return principle
p 25 A84-10399

BOWEN, T. P.

Software quality measurement for distributed systems, volume 1
[AD-A137955] p 92 N84-21128
Software quality measurement for distributed systems. Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129
Software quality measurement for distributed systems. Volume 3: Distributed computing systems. Impact on software quality
[AD-A137957] p 92 N84-21130

BOWERS, D. G.

A model of inter-organizational influences on organizational processes
[AD-A142450] p 23 N84-31037

BOWERS, J.

Computer system design environment software development plan
[AD-A131651] p 41 N84-12747

BOYLESS, J. A.

Management information systems: A need for human factors
[AD-P003313] p 8 N84-28452

BOYNTON, J. G.

The creation of a central database on a microcomputer network
[AD-A143875] p 59 N84-34326

BRANSTAD, M.

Software engineering project standards
p 90 A84-24450

BRAUN, C. L.

Ada (Trademark) training considerations
[AD-P003560] p 10 N84-31164

BRAUNSTEIN, D. R.

NASA's emerging productivity program
p 92 N84-21404

BRECHTEL, D. L.

Competitive procurements: The synergistic linkage among government, industry and academe
[AD-P002773] p 73 N84-23320

BREITBART, Y. J.

RIM as an implementation tool for a distributed heterogeneous database
p 48 N84-22311

BRETSCHER, M. E.

Guide to reporting time in the financial information system at ANL
[DE84-009356] p 6 N84-25524

BRETT, S. F.

Tendering on a micro computer
p 28 N84-14700

BREWER, J. M.

Revitalization: An organizational program for the individual
[DE83-014949] p 2 N84-13013

BRICE, L.

Benchmarking unstructured systems
[DE83-011175] p 15 N84-14969

BROCK, G. H.

The administrative window into the integrated DBMS
p 58 N84-33270

BROOKS, P.

Human engineering guidelines for management information systems. Change 1
[AD-A137808] p 4 N84-21104

BROST, E. J.

Competitive procurements: The synergistic linkage among government, industry and academe
[AD-P002773] p 73 N84-23320

BROUSE, J. A., JR.

Analysis of modern analog and digital communication channels from a manager's perspective
[AD-A143161] p 57 N84-31494

BROWN, C.

Managing for success in defense systems acquisition
[AD-P002789] p 64 N84-23336

BROWN, D. R.

Recommendations for NASA research and development in artificial intelligence
[NASA-CR-170585] p 32 N84-11817

BROWN, J. R.

Application of software engineering standards - A report on the state of the art
[AIAA PAPER 83-2356] p 88 A84-10026

BROWN, P.

Quality assurance - Air Force Logistics Command
[AD-P002816] p 93 N84-23361

BROWN, P. R.

Evaluation of the BCT (Basic Cadet Training) paraprofessional counselor training at the United States Air Force Academy
[AD-P003244] p 7 N84-28411

BROWN, W. S.

Commercialization of opportunities for materials processing in low gravity
[NASA-CR-170953] p 71 N84-15165

BUCCIARELLI, M. A.

A cost based acquisition planning model utilizing expert system concepts
[AD-P002783] p 73 N84-23330

BULTEL, J.

Value and competition
[SNIAS-832-501-101] p 76 N84-25504

BURNSIDE, B. L.

Training feedback handbook
[AD-A132565] p 2 N84-14683

BUTLER, J. L.

Guide to reporting time in the financial information system at ANL
[DE84-009356] p 6 N84-25524

BUTLER, R.

Evaluation of the HARDMAN comparability methodology for manpower, personnel and training
[NASA-CR-173733] p 9 N84-28485

BUTTERWORTH, J. R.

Increasing spares competition in AFLC (Air Force Logistics Center)
[AD-P002775] p 81 N84-23322

C**CAGE, J. H.**

Subordinate perceptions of contingent leaders: Do followers accept our theories?
[AD-P003248] p 22 N84-28415

CALLAMARAS, P. V.

A method for designing computer support documentation
[AD-A134466] p 44 N84-16831

CALLENDER, E. D.

Building an information model (with the help of PSL/PSA)
[AIAA PAPER 83-2329] p 37 A84-10011

CAMPBELL, G.

Central Demand Data Base (CDDB) End Item Code (EIC)
[AD-P002807] p 83 N84-23353

CARD, D.

Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150

CARLISLE, A. E.

Integrated budget control using a desktop computer
p 70 N84-14697

CARPENTER, M. P.

Further delineation of the utilization of scientific literature by U.S. patents
[PB84-100734] p 100 N84-18095

CARREON, N.

Models of purposive human organization: A comparative study
[AD-A138871] p 19 N84-24491

CARRIER, L. M.

Avionics software management and control
p 39 A84-26714

CARRILLO, M. J.

A development of logistics management models for the Space Transportation System
[NASA-CR-173504] p 84 N84-23664

- CARSON, M.**
Now: An initial approach to collection of major material systems actual costs
[AD-A139845] p 76 N84-25505
- CARTER, W. D.**
New opportunities for the private sector in space technology p 69 A84-49145
- CASPERSON, J.**
Concurrency of design criteria: A key to trainer readiness
[AD-P003454] p 10 N84-32231
- CAYTON, T.**
Psychological and biochemical effects of a stress management program
[AD-P003300] p 7 N84-28447
- CHA, Y. Y.**
The decision for the optimal price in competitive bidding: The case of a Korean construction company
[AD-A140556] p 65 N84-27585
- CHANDRASEKARAN, B.**
Expert systems for price analysis: A feasibility study
[AD-P002795] p 74 N84-23341
An intelligent manual for price analysis
[AD-P002798] p 75 N84-23344
The design of an expert system for contract price analysis
[AD-A140827] p 77 N84-28662
- CHEESEMAN, P. C.**
Recommendations for NASA research and development in artificial intelligence
[NASA-CR-170585] p 32 N84-11817
- CHESHIRE, L. F.**
The avionics integrity program (AVIP)
[AD-P002817] p 93 N84-23362
- CHEVALLIER, M. J.**
The 'Value Analysis' tool p 67 A84-15320
- CHIA, Y. Y.**
Airline Maintenance Management System (AMMS)
p 79 A84-46582
- CHIQUELIN, J. J.**
Mid-robots get underway in September: Lab-industry link p 36 N84-34649
- CHMURA, L. J.**
Accuracy of software development activity data: The software cost reduction project
[AD-A137639] p 71 N84-21122
- CHRISTEL, K. J.**
Risk management - A necessary tool for satellite owners and users p 69 A84-34770
- CHUGUNOVA, E. S.**
Social-psychological problems in the evaluation of engineering personnel in automated systems for the control of developing enterprises p 1 A84-23706
- CHURCH, V.**
Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150
- CIUNDZIEWICKI, T.**
A program for developing automated scientific-information processing in maritime economy
[AD-A135518] p 45 N84-18107
- CLARK, C. T.**
Data envelopment analysis and extensions for decision support and management planning
[AD-A139430] p 19 N84-24489
- CLARK, J. C.**
Managing aircraft/simulator concurrency
[AD-P003463] p 86 N84-32240
- CLELAND, D. I.**
Project management: Evolution and influence
[AD-P002824] p 64 N84-23369
- COCKERHAM, J. M.**
Cost risk trade-offs in timing the production decision
[AD-P002753] p 29 N84-23300
- COFFEY, M.**
The impact of a computerized network on the quality of work life in two college of advanced education libraries in New South Wales p 9 N84-29792
- COLEMAN, S.**
Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 7: MFG01 glossary
[AD-A144426] p 36 N84-34991
- COLLINS, A.**
Applied cognitive science
[AD-A136780] p 4 N84-20185
- COLLINS, D. E.**
Management of logistic support costs in the equipment acquisition phase p 79 A84-15213
- COLLINS, O. M.**
Impact of corporate resource allocation decisions on national security objectives: Dissynergism in aerospace industrial resource planning
[AD-P002801] p 29 N84-23347
- CONLON, E. J.**
A field study of Air Force organization structures
[AD-A142389] p 23 N84-31035
- CONNELL, J.**
Benchmarking unstructured systems
[DE83-011175] p 15 N84-14969
- CONNOLLY, T.**
Information search in judgment tasks: The effects of unequal cue validity and cost
[AD-A141712] p 23 N84-29437
- COOK, C. R.**
The acquisition management information system: Friend or foe?
[AD-P002751] p 50 N84-23298
- COOK, J. T.**
The liability of the United States for negligent inspection 1983 p 97 A84-20454
- COOLEY, J. E.**
Qualification testing and electrical measurement experience: A manufacturer's view p 96 N84-32705
- COOPER, J.**
Software development management planning p 38 A84-24449
- COOPER, L.**
Managing program risk: One way to reduce cost growth
[AD-P002754] p 72 N84-23301
- COPPOCK, E. G.**
Management of aerospace contract documentation by industry and government
[DE84-900451] p 47 N84-21396
Management of aerospace contract documentation by industry and government p 48 N84-21434
- COPPOLA, A.**
Artificial intelligence applications to maintenance technology working group report IDA/OSD R and M (Institute for Defense Analyses/Office of the Secretary of Defense Reliability and Maintainability) study
[AD-A137329] p 33 N84-19827
- CORDE, V. M.**
Preferences on technical report format - Results of a survey p 39 A84-33153
The function of report components in the screening and reading of technical reports p 40 A84-45547
Report format preferences of technical managers and nonmanagers p 40 A84-45572
- COSTON, V. A.**
Quality is not a dirty word
[DE83-012166] p 90 N84-12510
- COTELLESA, R. F.**
Report of the Information Technology Workshop
[AD-A144212] p 37 N84-35126
- COUILLARD, M. PH.**
Management of a space project p 60 A84-15306
- COX, J. E.**
Program Manager's Support System (PMSS): An update
[AD-P002825] p 50 N84-23370
- CRABTREE, M. S.**
Development and application of a criterion task set for workload metric evaluation
[SAE PAPER 831419] p 1 A84-29482
- CROMPTON, E. K.**
The technical and economic considerations of bringing satellite communications to small mobile users p 69 A84-37900
- CRUZ, J. B., JR.**
Incentive Stackelberg strategies for deterministic multi-stage decision processes p 13 A84-19141
- CZAJKOWSKI, A. F.**
Managerial decision-making in establishing R&M design goals p 89 A84-15211
- D**
- DAFT, R. L.**
The nature and use of formal control systems for management control and strategy implementation
[AD-A139083] p 20 N84-24493
A field study of Air Force organization structures
[AD-A142389] p 23 N84-31035
An exploratory analysis of the relationship between media richness and managerial information processing
[AD-A143503] p 24 N84-33293
- DALE, B. C.**
DBMS conversion case study
[DE84-011205] p 55 N84-31054
- DALZIEL, M. M.**
Organizational structures, processes, and problems: A literature review and taxonomy
[AD-A140979] p 23 N84-28665
- DANDEU, R.**
The establishment of prices and costs p 66 A84-15315
- DANIEL, J. W.**
Science in the European Economic Community: A self-assessment and a detailed plan of action
[AD-A139078] p 102 N84-24492
- DASCHBACH, J.**
The make or buy decision—its nature and impact
[AD-P002779] p 82 N84-23326
Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381
Evaluating the availability, role, and performance of subcontractors in the aerospace industry
[AD-A141408] p 85 N84-29788
- DASILVA, C. R. T.**
SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512
- DAVENPORT, A. S.**
A model of inter-organizational influences on organizational processes
[AD-A142450] p 23 N84-31037
- DAVIES, M.**
Integrated Computer-Aided Manufacturing (ICAM) architecture part 3. Volume 1: Architecture part 3: Accomplishments
[AD-A134249] p 33 N84-16829
- DAVIS, B.**
Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 7: MFG01 glossary
[AD-A144426] p 36 N84-34991
- DAVIS, B. R.**
Integrated Computer-Aided Manufacturing (ICAM) architecture part 3. Volume 1: Architecture part 3: Accomplishments
[AD-A134249] p 33 N84-16829
- DAVISON, C.**
Air carrier liability under deregulation p 97 A84-25033
- DAVISSON, W. I.**
The make or buy decision—its nature and impact
[AD-P002779] p 82 N84-23326
Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381
Evaluating the availability, role, and performance of subcontractors in the aerospace industry
[AD-A141408] p 85 N84-29788
- DAVYDENKO, E.**
Impact of Latvian Robotics Institute on industry modernization p 35 N84-24110
- DE CACQUERIEY, A.**
Management of large space projects - Quality assurance or 'product assurance' p 89 A84-15310
- DE LEO, J. J.**
Hughes' software engineering procedures improve quality - Do they help productivity?
[AIAA PAPER 83-2357] p 88 A84-10027
- DEC. RALVES, H. O.**
SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512
- DEEM, R. N.**
Unified database development program
[AD-A140309] p 52 N84-26471
- DEERING, A. M.**
International competition in commercial aerospace markets
[AAS PAPER 83-244] p 68 A84-29883
- DEFREITAS, U. M.**
SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512
- DEJONG, G.**
Artificial intelligence implications for information retrieval
[AD-A131382] p 32 N84-11821
- DEKKER, G. J.**
Functional requirements for the development and use of a software-cost database
[AD-B079998] p 72 N84-22287
- DELMAS, M. G.**
Human organization p 59 A84-15303
- DELORENZO, J. M.**
Comparative analysis of government and private sector ADP acquisition
[AD-A144523] p 59 N84-35131
- DEMOEL, R. P.**
Security, a set of rules or an approach
[NLR-MP-82047-U] p 47 N84-20442
- DEMONG, R. F.**
Award fee contract provisions as a program management tool
[AD-P002776] p 63 N84-23323
- DENEMARK, D. L.**
Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 3
[AD-A131878] p 27 N84-12051
Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 2
[AD-A131877] p 27 N84-12052

- Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary
[AD-A131876] p 27 N84-12053
- DENEZZA, R. E.**
The Program Planning Review (PPR): Milestone or milestone?
[AD-P003493] p 87 N84-32259
- DENISON, R. L.**
Air force technical objective document FY 85
[AD-A141925] p 86 N84-31033
- DENNIS, B. K.**
Strengthening small business participation in Department of Defense extramural research and development
[AD-P002832] p 64 N84-23377
- DENTY, M. A.**
Success with Data Management 4 at the DOE Pinellas Plant
[DE84-008021] p 55 N84-29802
- DEPUY, W. E., JR.**
US military aircraft cost handbook
[AD-A136035] p 71 N84-18158
- DERRICK, W. L.**
A multiple processing resource explanation of the subjective dimensions of operator workload
[AD-A141455] p 9 N84-29480
- DHAR, V.**
Knowledge-based support systems for long range planning
[AD-A137311] p 17 N84-20424
- DIAKITE, L.**
The Integrated Software Engineering Facilities (ISEF) software configuration management system
p 42 N84-14732
- DICKMAN, T. J.**
The avionics integrity program (AVIP)
[AD-P002817] p 93 N84-23362
- DILL, D. D.**
The effectiveness of project managers - Implications of a political model of influence
p 14 A84-42622
- DILLARD, J. F.**
Expert systems for price analysis: A feasibility study
[AD-P002795] p 74 N84-23341
An intelligent manual for price analysis
[AD-P002798] p 75 N84-23344
The design of an expert system for contract price analysis
[AD-A140927] p 77 N84-28662
- DINNAT, R. M.**
Models of purposive human organization: A comparative study
[AD-A138871] p 19 N84-24491
- DIXON, E. J.**
The database management module of the SPLICE system
[AD-A132795] p 85 N84-28671
- DJAFERIS, T. E.**
Research in adaptive control hybrid and constrained structure systems
[AD-A140496] p 20 N84-26345
- DOERFLINGER, C. W.**
Monitoring software development through dynamic variables
p 49 N84-23139
- DOHERTY, F. E.**
Contract requirements: A key to controlling DoD acquisition costs
[AD-P002828] p 76 N84-23373
- DOLK, D. R.**
A knowledge-based system for LP (Linear Programming) modeling
[AD-A139991] p 35 N84-25357
- DOMAIN, J. S.**
A concept for mission-oriented planning for system acquisition at the Defense Communications Agency
[AD-P002823] p 19 N84-23368
- DONCHIN, E.**
Psychophysiological tools in engineering psychology
[AD-P003337] p 8 N84-28461
- DONDI, G.**
The workload of European space industry - Current situation and foreseeable trends
p 26 A84-38468
- DOOFILHO, E. F.**
SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512
- DOOLITTLE, T. L.**
Physical performance tests as predictors of task performance
[AD-P003257] p 7 N84-28424
- DOUGLASS, R. J.**
Modeling the user in intelligent user interfaces
[DE84-012664] p 2 N84-14795
- DOWLING, E. J.**
A host-target programming support environment for the production of high-quality real-time systems
p 43 N84-14753

- DOWNING, E. J., JR.**
Economic production rate study
[AD-P002783] p 74 N84-23340
- DOYLE, B.**
Human engineering guidelines for management information systems. Change 1
[AD-A137808] p 4 N84-21104
- DREW, R. C.**
Programs designed to help small businesses commercialize devices invented by NASA, DOD, and other federal agencies - A case history
p 70 A84-49413
- DUBAYAH, R.**
Applying artificial intelligence to large networks
p 35 N84-31743
- DUBE, R. P.**
Computer-assisted engineering data base
[ASME PAPER 83-WA/AERO-11] p 32 A84-30608
Managing geometric information with a data base management system
p 48 N84-22211
- DUBE, W.**
Training capabilities: The facility part of the equation
[AD-P003457] p 11 N84-32234
- DUBOIS, M. E., JR.**
Office automation: A look beyond word processing
[AD-A132764] p 53 N84-28670
- DUMAS, R. L.**
Software Acquisition Resource Expenditure (SARE) data collection methodology
[AD-A137084] p 71 N84-20247
- DUNCAN, L. D.**
An evaluation of the system 2000 data base management system for use in major item system mapping
[DE84-013130] p 87 N84-32296
- DUNKLE, S. B.**
Workshop on Magnetic Information Technology (MINT)
[PB84-125210] p 45 N84-18619
- DUPREEZ, P. J. J.**
Productivity improvement in a jobbing shop
p 28 N84-18449
- DURHAM, R. L.**
Situational interaction: A peer counseling approach to AWOL (unauthorized absences from duty) reduction
[AD-P003243] p 7 N84-28410
- DUSSAULT, H. B.**
The evolution and practical applications of failure modes and effects analyses
[AD-A131358] p 90 N84-11778
- DYMOND, L. H.**
Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 3
[AD-A131878] p 27 N84-12051
Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 2
[AD-A131877] p 27 N84-12052
Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary
[AD-A131876] p 27 N84-12053

E

- ECUNG, M.**
The microcomputer in the acquisition environment
[AD-P002748] p 49 N84-23295
- EDELBLUTE, M. C.**
The Score technique: An analytical approach for assessing the results of manufacturing reviews
[AD-P002838] p 30 N84-23383
- EDWARDS, W.**
Equal weights, flat maxima, and trivial decisions
[AD-A138506] p 18 N84-22342
- EGAN, L. G., JR.**
An integrated approach to a successful embedded computer resource project
[AD-P003574] p 56 N84-31179
- EHRRICH, R. W.**
DMS - A system for defining and managing human-computer dialogues
p 1 A84-21640
- EHRRICKE, K. A.**
Profitability of manufacturing in space in view of lunar industrial development and geo-socio-economic benefits
p 25 A84-22344
- ELLIOTT, B. W.**
Models of purposive human organization: A comparative study
[AD-A138871] p 19 N84-24491
- ELLIS, C. S.**
The ROE file system
[AD-A140497] p 52 N84-26473
- EMILIO, C.**
Situational interaction: A peer counseling approach to AWOL (unauthorized absences from duty) reduction
[AD-P003243] p 7 N84-28410

- ENDICOTT, D. L., JR.**
MITS II (Microfiche Image Transmission System) investigations and design alternatives
[AD-A141040] p 54 N84-28673
- ENGLISH, J. J.**
Project manager's guide
[DE83-014454] p 62 N84-11977
- ERDLE, F. E.**
Reliability programs for commercial communication satellites
p 88 A84-15209
- ERVIN, L. C.**
Tactical buying decisions for strategic petroleum reserve spot procurements: The tunnel theory
[AD-P002812] p 75 N84-23358
- ESTADIEU, B.**
The progression of projects
p 60 A84-15305
- EVANS, M.**
Crisis avoidance in a software management situation
p 38 A84-26710
- EVANS, M. W.**
Cost/schedule management for software development
[AD-P003591] p 56 N84-31196
Software configuration management in a project environment
[AD-P003592] p 57 N84-31197
Quality control in large systems development phase
[SNIAS-832-422-102] p 94 N84-25074

F

- FABRY, R. S.**
Design and performance of a distributed relational data base system
[AD-A142177] p 54 N84-29485
- FACCIA, G.**
AMIX: An automated system for handling error notification data
p 91 N84-14734
- FAIN, R. L.**
The O'Hare Runway Configuration Management System
p 79 A84-44732
- FAINTER, R. G.**
GENIE: A computer-based task for experiments in human-computer interaction
[AD-A137473] p 3 N84-20181
- FARH, J. L.**
The effects of task variability, sensory reinforcement, and monetary reinforcement on performance, satisfaction, and intrinsic motivation
p 7 N84-27584
- FARMER, R. E.**
MATE standardization
[AD-P003587] p 95 N84-31192
- FARNY, A. M.**
Building an information model (with the help of PSL/PSA)
[AIAA PAPER 83-2329] p 37 A84-10011
- FAWCETT, C. A. S.**
Financing a solar power satellite project
p 68 A84-21482
- FEDYAKIN, V.**
Applications of academic research neglected by industry
p 62 N84-11044
- FEIGENBAUM, I. A.**
Reliability programs for commercial communication satellites
p 88 A84-15209
- FENVES, S. J.**
The role of DBMS in design research
p 34 N84-22317
- FETISKIN, N. P.**
Significance of allowing for individual differences in organizing the work shift in monotonous production work
p 2 A84-32353
- FEWELL, M. E.**
Quality Assurance (QA) procedures for computer software in department 1510
[DE84-012131] p 95 N84-30778
- FILEP, R. T.**
Commercial communications satellite market and technology in the 80's
[IAF PAPER 83-86] p 66 A84-11739
- FILIPPOV, A. V.**
Psychology and the study of 'human factors' in management
p 2 A84-41555
- FISCELLA, J. M.**
Development of a proposed standard for the exchange of scientific microcomputer programs
[PB84-157940] p 94 N84-24244
- FISHBURNE, F. J.**
Age effects on active duty Army MMPI (Minnesota Multiphasic Personality Inventory) profiles
[AD-P003343] p 9 N84-28464
- FISHMAN, G. S.**
Estimating critical path and arc probabilities in stochastic activity networks
[AD-A134255] p 16 N84-16925

- FLEISCHMANN, A.**
Is critical path planning the answer
p 15 N84-14705
- FLORES, C., JR.**
Software control and system configuration management
- A process that works p 38 A84-26713
Software control and system configuration management:
A systems-wide approach
[NASA-TM-85908] p 56 N84-31112
- FLORIO, U. G.**
An approach to logistic problems by the L-transform
method p 80 N84-15884
The life cycle cost of integrated logistic support
p 85 N84-26962
- FLOYD, R. A.**
The ROE file system
[AD-A140497] p 52 N84-26473
- FOULKES, R.**
Software configuration management and its contribution
to reliability program management p 89 A84-15217
- FOUSSIER, P.**
The recording of outlays and the projection of
completion p 67 A84-15317
Risk assessment p 12 A84-15322
- FRANCA, Z. M. P. D. S.**
Strategies and mechanisms for the diffusion of scientific
and technical information: A comparative study
p 51 N84-23406
- FRANKEL, S.**
Computer science and technology: Introduction to
software packages
[NBS-SP-500-114] p 55 N84-30740
- FRANKLIN, J. E.**
Navy AI programs - With emphasis on applications
[AIAA PAPER 83-2349] p 31 A84-10022
- FRAZIER, M. L.**
Timely application of advanced human factors test and
evaluation techniques during the acquisition of new Air
Force systems p 1 A84-19308
- FREEMAN, P.**
Comparing software development methodologies for
Ada (trade name): A study plan
[PB84-178029] p 53 N84-27491
- FRISCH, F. A. P.**
Mortality and spareparts: A conceptual analysis
[AD-P002826] p 83 N84-23371
- FROLA, F. R.**
System safety in aircraft acquisition
[AD-A141492] p 95 N84-28763
- FROMER, H. S.**
Multi-year procurement a 'Team approach'
[AD-P002780] p 82 N84-23327
- FROMME, W. R.**
The Aviation Safety Analysis System (ASAS) - An
overview p 90 A84-41079
- G**
- GALANTE, F. M.**
Some technical and contractual aspects of transponder
leasing by EUTELSAT p 79 A84-20645
- GALLAGHER, R. C.**
Reducing design prototyping and production cycle times
and costs p 31 A84-17159
- GALZIN, M. F.**
Cost estimation and estimate analysis
p 67 A84-15316
- GAMBLE, W. W.**
Some management initiatives to improve embedded
commercial computer and training device life cycle
support
[AD-P003494] p 11 N84-32260
- GARCIA, J. F. L.**
Microcomputers: A tool for planning and scheduling
construction projects
[PB83-211201] p 27 N84-11053
- GARCIA, S. K.**
Validation of relative-time-spent rating scales
[AD-A144067] p 12 N84-34169
- GARDELLA, P. R., JR.**
The determination of user information requirements
during the development of management information
systems
[AD-A132998] p 43 N84-14980
- GARDINER, P. C.**
An application of the causal-integrative model
[AD-P002786] p 18 N84-23333
- GARMAN, J. R.**
Forecasting trends in NASA flight software development
tools
[AIAA PAPER 83-2334] p 38 A84-10065
- GARTLING, D. K.**
Quality Assurance (QA) procedures for computer
software in department 1510
[DE84-012131] p 95 N84-30778
- GATEWOOD, J. D.**
Applications programs to facilitate use of a DBMS to
store and retrieve graphics displays (INGRED 2)
[AD-A138059] p 54 N84-28672
- GAZDIK, I.**
Fuzzy-network planning - FNET p 12 A84-15220
- GEER, N. F.**
Gridnet - An alternative large distributed network
p 39 A84-31351
- GERS, S.**
Keeping your fingers crossed won't help
p 28 N84-14702
- GHANOUNI, P.**
Motivation and work performance: A comparative and
analytical study p 6 N84-27441
- GIBBONS, H. L.**
Regulations and the air ambulance p 97 A84-24961
- GIBBONS, R. T.**
Material handling: A target for productivity
improvement [AD-P002829] p 83 N84-23374
- GILBERT, D.**
Computer science and technology: Microcomputer: A
review of federal agency experiences
[PB83-238972] p 41 N84-11772
Computer science and technology: Selection of
microcomputer systems
[PB84-167725] p 51 N84-25331
- GILL, D.**
Employment changes resulting from the award of
contracts in labor surplus areas
[AD-P002834] p 83 N84-23379
- GILL, J. H.**
Assumption of risk in the R and D environment
[AD-P002757] p 72 N84-23304
- GILLES, D. L.**
The effect of regulation 25.1309 on aircraft design and
maintenance
[SAE PAPER 831406] p 98 A84-29627
- GILLET, W. D.**
A total system design framework p 39 A84-41201
- GINNETT, R. C.**
To the wilderness and beyond: The application of a
model for transformational change
[AD-P003249] p 22 N84-28416
- GLASS, D. V.**
Improved management of support resources
[AD-P002808] p 83 N84-23354
- GLASSMAN, M.**
Preferences on technical report format - Results of a
survey p 39 A84-33153
Report format preferences of technical managers and
nonmanagers p 40 A84-45572
- GLAZER, A.**
Search among queues
[AD-A131639] p 70 N84-12773
- GLYNN, P. W.**
Equitable assignment rules
[AD-A142809] p 24 N84-32268
- GOEBEL, A. J.**
Assessing contracting workforce requirements in the
matrixed organization
[AD-P002760] p 5 N84-23307
- GOLDFINE, A.**
Specifications for a federal information processing
standard data dictionary system p 93 N84-21414
- GOLDMAN, P. A.**
NTSB procedures p 98 A84-27416
- GOLLUB, R.**
Motivating managers: A guide to performance targeting
and performance-based pay in state and local
governments
[PB83-237834] p 14 N84-11978
- GOMIDE, F. A. C.**
The multiobjective multistage impact analysis method
Theoretical basis p 14 A84-33465
- GOOD, W. A.**
International competition in commercial aerospace
markets
[AAS PAPER 83-244] p 68 A84-29883
- GOODMAN, P. S.**
The human side of robotics: Results from a prototype
study on how workers react to a robot
[AD-A133438] p 33 N84-15805
- GOODMAN, W. H.**
The fine art of accepting an airliner
p 25 A84-11274
- GOROVE, S.**
Major concerns of private enterprise regarding recent
developments in space law
[AAS PAPER 83-221] p 98 A84-29865
- GOTTSCHALK, G.**
Analysis of incentives for productivity-enhancing
investment
[AD-P002770] p 73 N84-23317
- GRAF, H. A.**
Gridnet - An alternative large distributed network
p 39 A84-31351
- GRAHAM, D. R.**
Deregulating the airlines: An economic analysis
[PB83-250019] p 100 N84-14070
- GRAHAM, J. L., JR.**
Mobilization and defense management technical reports
series. Management implications of industrial support
capabilities for Space Shuttle operations
[AD-A137460] p 81 N84-19390
- GRAHLMAN, R. B.**
Methodology for benefit analysis of CAD/CAM
(Computer-Aided Design/Computer-Aided Manufacturing)
in USN shipyards
[AD-A138398] p 34 N84-22270
- GRAY, D. L.**
Multiyear subcontractor selection criteria analysis
[AD-A135638] p 80 N84-19126
- GRAY, G. K.**
A guide to macro and micro computer performance
evaluation
[AD-A140127] p 51 N84-25329
- GRAY, V.**
Evaluation of the HARDMAN comparability methodology
for manpower, personnel and training
[NASA-CR-173733] p 9 N84-28485
- GREEN, R. O.**
Management information system for engineering
[DE84-001655] p 28 N84-14984
- GREER, W. R., JR.**
Contractor 'Hungriness' and the relative profitability of
DoD business
[AD-P002796] p 74 N84-23342
- GREINER, J. M.**
Motivating managers: A guide to performance targeting
and performance-based pay in state and local
governments
[PB83-237834] p 14 N84-11978
- GREY, J.**
Aerospace technology and commercial nuclear power;
Proceedings of the Workshop Conference, Williamsburg,
VA, November 18-20, 1981 p 25 A84-19449
- GRIFFIN, E. L.**
Standards and integrated avionic digital system
architecture
[AD-P003561] p 95 N84-31166
- GRIFFITHS, H. W.**
Design QA on a small batch project
p 92 N84-17603
- GROPP, W. D.**
Important CAD/CAM utilization at MBB
[MBB-Z-13-83-O] p 35 N84-26451
- GSCHREL, U.**
On a series of problems with machines: Costs of
modernization and storage in case of demand
[TUM-M8312] p 30 N84-25863
- GUERRA, G.**
Analysis of the influence of the load factor in planning
aircraft transport capacity p 68 A84-25192
- GUPTA, S. S.**
On using selection procedures with binomial models
[AD-A135275] p 16 N84-17957
- GUPTA, Y. P.**
Reliability cost estimation - Managerial perspectives
p 66 A84-15215
- GUSTAFSON, H. W.**
Study of the FAA (Federal Aviation Administration)
program to modernize maintenance operations
[AD-A142295] p 86 N84-29848
- GUY, S. R.**
GENIE: A computer-based task for experiments in
human-computer interaction
[AD-A137473] p 3 N84-20181
- GUYTON, R. D.**
The impact of factory automation and robotics on the
contracting and acquisition processes
[AD-P002830] p 34 N84-23375
- H**
- HACKMAN, J. R.**
A normative model of work team effectiveness
[AD-A136398] p 17 N84-20165
- HAGGERTY, J. J.**
Spinoff, 1984
[NASA-TM-85596] p 65 N84-33305
- HAIMES, Y. Y.**
The multiobjective multistage impact analysis method
Theoretical basis p 14 A84-33465
- HAKKINEN, M. T.**
GENIE: A computer-based task for experiments in
human-computer interaction
[AD-A137473] p 3 N84-20181

HALL, D. L.

- The NASA Software Management and Assurance Program
[AIAA PAPER 83-2336] p 37 A84-10015
ALDS project: Motivation, statistical database management issues, perspectives, and directions
[DE84-001412] p 44 N84-14983

HAMILTON, W. P., III

- Local automation model: System specification
[AD-A141503] p 54 N84-29798

HAMMOND, R.

- Proceedings of the 2nd International Workshop on Statistical Database Management
[DE84-005866] p 52 N84-25522

HANKINSON, A.

- Computer science and technology: Selection of microcomputer systems
[PB84-167725] p 51 N84-25331

HANSON, R. J.

- Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text
p 39 A84-44325

HARGROVE, J. W., JR.

- Selection of multiple sources in weapon systems acquisition
[AD-P002837] p 84 N84-23382

HARLESS, M. W.

- Models of purposive human organization: A comparative study
[AD-A138871] p 19 N84-24491

HARMON, S.

- A survey of European robotics research
[AD-A138952] p 34 N84-23122

HARRELL, A. M.

- Identifying operative goals by modeling project selection decisions in research and development
p 12 A84-15599

HARRISON, F.

- Organizational correlates of perceived role performance in the research laboratory
p 14 A84-42619

HARRISON, T. G.

- An intelligent manual for price analysis
[AD-P002798] p 75 N84-23344

HART, G. W.

- The application of management techniques to defence and other information services: The British approach
p 48 N84-21433

HARTMANN, G. K.

- The Optical Coincidence Information Retrieval system (OCIR)
[MPAE-L-66-84-10] p 56 N84-31059

HARTT, R. W.

- Local automation model: System specification
[AD-A141503] p 54 N84-29798

HARTWEG, L. R.

- RIM as an implementation tool for a distributed heterogeneous database
p 48 N84-22311

HARVEY, D. R.

- Leadership, managership, and computers in today's Air Force
[AD-P003351] p 22 N84-28468

HASSIN, R.

- Search among queues
[AD-A131639] p 70 N84-12773

HATRY, H. P.

- Motivating managers: A guide to performance targeting and performance-based pay in state and local governments
[PB83-237834] p 14 N84-11978

HAUSTEIN, H. D.

- Decision support for innovation management: Application to the lighting industry
[IIASA-RR-83-29] p 20 N84-25503

HAWLEY, T. B.

- Contemporary business outlook for large space ventures: Financing, management, construction
[AAS PAPER 83-242] p 68 A84-29881

HAYES, P.

- Automated RTOP management system
p 47 N84-21406

HAYS, R. T.

- Research issues in training device design: The organization of a data base
[AD-A140815] p 6 N84-26710

HEAD, R. C.

- Competition: An integral part of the acquisition process
[AD-P002774] p 73 N84-23321

HECHT, H.

- Microcomputers: Introduction to features and uses
[PB84-178821] p 53 N84-27456

HECHT, M.

- Microcomputers: Introduction to features and uses
[PB84-178821] p 53 N84-27456

HEENAN, A. T.

- Alternative strategies for space station financing
[NASA-CR-175412] p 72 N84-21437

HEEREMA, F. J.

- A data management and presentation tool for engineering and research
[NLR-MP-83044-U] p 53 N84-27482

HEFFLEY, E.

- Psychophysiological tools in engineering psychology
[AD-P003337] p 8 N84-28461

HEINE, R.

- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 7: MFG01 glossary
[AD-A144426] p 36 N84-34991

HEINZ, H. A.

- An analysis of the acquisition strategy decision process along three dimensions of the acquisition improvement program
[AD-P002758] p 18 N84-23305

HELBLING, V. M.

- Microcomputer software system development: Suggested revisions to MIL-STD-1521A for cost-effective acquisition of custom software through software engineering
[AD-A134363] p 44 N84-16830

HELMES, C. P.

- A study of temporary task teams
p 2 A84-31212

HENDRICKS, D. E.

- Human engineering guidelines for management information systems. Change 1
[AD-A137808] p 4 N84-21104

HENRY, C. R.

- Quality at the crossroads
[AD-P002818] p 93 N84-23363

HERBERT, D. P.

- Aircraft accident enquiries - Whose interest prevails?
p 98 A84-27412

HERMAN, J. G.

- NU - A network monitoring, control, and management system
p 40 A84-49262

HERRING, C. E., JR.

- Automated Construction Management System (ACMS). Volume 1: User's guide
[AD-A143031] p 30 N84-31971

- Automated Construction Management System (ACMS). Volume 2: Program documentation
[AD-A143032] p 30 N84-31972

HILL, R. E.

- The occupational interests of R&D managers and technical specialists - Some preliminary findings
p 61 A84-23988

HILL, S. M.

- The launch and performance of spacecraft - An insurance perspective
p 97 A84-20846

HINTON, T.

- Cost estimation of research and development projects
[ASME PAPER 83-WA/MGT-4] p 69 A84-30646

HODGE, J. E.

- Automated administrative data bases
p 47 N84-21411

HOLMES, J.

- Assessment of the NASA Flight Assurance Review Program
[NASA-CR-173418] p 94 N84-23401

HOLT, K. J.

- Flight test airspace - A vital part of the plan
[AIAA PAPER 83-2711] p 78 A84-12316

HOLT, S.

- Manual for implementing a Shared Time Engineering Program (STEP) September 1980 through September 1983
[PB84-144260] p 29 N84-21765

HOROWITZ, E.

- Design of office information systems
[AD-A136523] p 46 N84-19170

HORT, H.

- R&D management and financial performance
p 61 A84-15598

HOUGHTON, R. C., JR.

- Comparing software development methodologies for Ada (trade name): A study plan
[PB84-178029] p 53 N84-27491

HOWARD, P. W.

- Evaluating organizational change through improved understanding of managerial schemata
p 21 N84-27596

HOWERTON, Y. F.

- Closing the gap between R and D and application in academe to better support government and industry
[AD-P002761] p 63 N84-23308

HRUSCHKA, P.

- The software engineering environment project model (PROMOD)
p 42 N84-14737

HULTON, V. N.

- Productivity improvement in a purchase division: Evaluation of a Performance Contingent Reward System (PCRS)
[AD-A133589] p 71 N84-16801

HUNTER, W. G.

- Experimental design: Review and comment
[AD-A139268] p 19 N84-24309

HUSSAR, J. S.

- A comparison of simulator procurement/program practices: Military versus commercial
[AD-P003453] p 86 N84-32230

HYMAN, J. M.

- Future directions in large-scale scientific computing
[DE83-013229] p 40 N84-10807

HYND, D. A.

- Measuring quality achievements
p 92 N84-17605

I

ICHIKAWA, A.

- An interactive system for supporting multiobjective decision making
p 13 A84-21643

IHANAT, D. J.

- An analysis of the effectiveness of the problem solving skills for managers training package-USCG
[AD-A144017] p 12 N84-34317

ILGEN, D. R.

- Personnel technology: Performance appraisal, a process approach
[AD-A138359] p 4 N84-23112

INGALLS, T.

- Program Manager's Support System (PMSS): An update
[AD-P002825] p 50 N84-23370

IVAKHNOV, A.

- Problems of prompt adoption of new technology discussed
p 50 N84-23396

IVERSTINE, E. C.

- Managing microcomputers: A survival kit for functional managers
[AD-A144006] p 59 N84-34316

J

JACOBS, B. E.

- Method for accessing distributed heterogeneous databases
p 47 N84-21412

JACOBSEN, S. E.

- A development of logistics management models for the Space Transportation System
[NASA-CR-173504] p 84 N84-23664

JAMES, S. E.

- Technical and economic analysis of the planned visual display terminal employment for the Stock Point Logistics Integrated Communications Environment (SPLICE)
[AD-A133642] p 80 N84-14711

JARRETT, J. R.

- Automated administrative data bases
p 47 N84-21411

- Administrative automation in a scientific environment
p 58 N84-33269

JEFFREY, R. B.

- The growth of American judicial hostility towards the liability limitations of the Warsaw convention
p 97 A84-20456

JENSEN, E. D.

- Decentralized resource management for embedded computers
[AIAA PAPER 83-2405] p 37 A84-10048

JOHN, R. S.

- Equal weights, flat maxima, and trivial decisions
[AD-A138506] p 18 N84-22342

JOHNSON, C. A.

- Evaluation results for the interactive video competency recognition system
[AD-A133052] p 2 N84-15796

JOHNSON, H. R.

- Computer-assisted engineering data base
[ASME PAPER 83-WA/AERO-11] p 32 A84-30608

JOHNSON, K. B.

- Two-step industrial preparedness planning: Balancing funds and production capability
[AD-P002802] p 29 N84-23348

JOHNSON, L. L.

- Scientific and technical information transfer: Issues and options
[RAND/N-2131-NSF] p 65 N84-33286

JONAS, J.

- Concurrency of design criteria: A key to trainer readiness
[AD-P003454] p 10 N84-32231

- JONES, D.**
Effective organizational solutions for implementation of DBMS software packages p 58 N84-33268
- JUROGIN, O.**
Use of robots in Estonian auto, machine tool industries viewed p 35 N84-23916

K

- KALBERER, G.**
The use of microcomputers for planned marketing [MBB-UA-703-83-OE] p 69 A84-31794
- KAMCHI, J. S.**
Training capabilities: The facility part of the equation [AD-P003457] p 11 N84-32234
- KAPLAN, D. P.**
Deregulating the airlines: An economic analysis [PB83-250019] p 100 N84-14070
- KARIS, D.**
Psychophysiological tools in engineering psychology [AD-P003337] p 8 N84-28461
- KARR, P. H.**
RIM as the data base management system for a material properties data base p 48 N84-22312
- KASAI, G. H.**
Avionics software management and control p 39 A84-26714
- KEAN, A.**
The Warsaw Convention - A discussion of the present position p 99 A84-44854
- KEINKE, D.**
Automated interface management for modular software development p 38 A84-16649
- KELLEY, P.**
Managing for success in defense systems acquisition [AD-P002789] p 64 N84-23336
- KENNEDY, J. J.**
Incentive contracts and cost growth [AD-A140930] p 85 N84-28663
- KENNEDY, R. S.**
Communication networks p 58 N84-33356
- KENNELLY, J. J.**
Aviation - The need for uniform legislation p 96 A84-14048
- KERNER, H.**
EDDA: A very high level data flow specification language p 42 N84-14735
- KERR, S.**
Organizational outcomes of creativity [AD-A132825] p 3 N84-16066
- KERSHENBAUM, A.**
Research in network management techniques for tactical data communications networks [AD-A131357] p 40 N84-11365
- KHODZHIMATOV, V.**
Measures to step up practical use of scientific work discussed p 26 N84-10350
- KIDD, J. S.**
A review of major issues relating to human-machine integration in the development of military systems [AD-A136739] p 3 N84-20184
- An introduction to human factors for engineering managers: Framework for a teaching unit [AD-A135958] p 4 N84-20428
- KILDUFF, P. W.**
Human engineering guidelines for management information systems. Change 1 [AD-A137808] p 4 N84-21104
- KIPP, C. W.**
Assessing contracting workforce requirements in the matrixed organization [AD-P002760] p 5 N84-23307
- KIPPS, P.**
Site computers p 28 N84-14701
- KIRK, E. J.**
Environments for evaluating performance of C3I (Command, Control, Communications, and Intelligence) systems [AD-P003237] p 21 N84-28404
- KLOMAN, E. H.**
Encouraging business ventures in space technologies [AAS PAPER 83-248] p 68 A84-29885
- KOBAYASHI, S.**
An interactive system for supporting multiobjective decision making p 13 A84-21643
- KOCH, H. S.**
Managing test-procedures to achieve reliable software p 89 A84-15219
- KOHOUTEK, H. J.**
R&D and quality assurance partnership p 90 A84-15597
- KOLESHNIKOV, A. S.**
Incentives for new production discussed p 102 N84-23388

- KONOVALOV, B.**
Computer developments at Institute of Automation and Electrometry described p 34 N84-23390
- KONVALINKA, M. J.**
Analysis of incentives for productivity-enhancing investment [AD-P002770] p 73 N84-23317
- KOPYSTYANSKAYA, K. R.**
Realization of human work capacity: Interdisciplinary problems p 10 N84-31920
- KORBIN, C. M.**
Quality Assurance (QA) procedures for computer software in department 1510 [DE84-012131] p 95 N84-30778
- KOSY, D. W.**
Knowledge-based support systems for long range planning [AD-A137311] p 17 N84-20424
- KOVALEV, A. G.**
Conflicts among employees and ways of resolving them p 1 A84-14980
- KOZMA, J.**
Academician Vamos interviewed on automation related problems p 36 N84-34972
- KRAIGER, K.**
Affective determinants of job perceptions [AD-P003258] p 7 N84-28425
- KRAKAT, K.**
Report on development, installation of industrial robots p 32 N84-11339
- KRAMER, A.**
Psychophysiological tools in engineering psychology [AD-P003337] p 8 N84-28461
- KRAUSE, C. F.**
The liability of the United States for negligent inspection 1983 p 97 A84-20454
- KREJUNKAMP, H. A.**
A data management and presentation tool for engineering and research [NLR-MP-83044-U] p 53 N84-27482
- KREISEL, G. R.**
US military aircraft cost handbook [AD-A136035] p 71 N84-18158
- KRIEGER, J. D.**
Prerequisites for the establishment of a professional acquisition workforce [AD-P002763] p 5 N84-23310
- KRISTIANSEN, D. M.**
Training feedback handbook [AD-A132565] p 2 N84-14683
- KRONE, R. M.**
Managing creative individuals in high-technology research projects p 1 A84-23990
- KUBAT, P.**
Managing test-procedures to achieve reliable software p 89 A84-15219
- KUETHE, F. W., III**
Automated interface management for modular software development p 38 A84-16649

L

- LARUE, S. L.**
Comparative analysis of government and private sector ADP acquisition [AD-A144523] p 59 N84-35131
- LAWLER, E. E., III**
Performance appraisal revisited [AD-A132841] p 3 N84-16059
- The design of effective reward systems [AD-A132859] p 3 N84-16067
- Motivation and performance appraisal behavior [AD-A134311] p 3 N84-17842
- LEACH, L. M.**
Impact of IPAD on CAD/CAM database university research p 34 N84-22318
- LEE, J. H.**
Applications of operations research and management information system concepts to management of large software projects p 47 N84-21204
- LEININGER, G.**
Reshaping the philosophy of spare parts acquisition: Project PACER PRICE [AD-P002791] p 82 N84-23338
- LENGEL, R. H.**
An exploratory analysis of the relationship between media richness and managerial information processing [AD-A143503] p 24 N84-33293
- LENIO, E. A.**
The introduction of uncertainty techniques to the productivity investment fund [AD-A140864] p 20 N84-27591
- LEONTEV, V.**
Organizational improvements in CEEMA scientific, technical cooperation sought p 62 N84-11039

- LESLIE, J. J.**
Manual for implementing a Shared Time Engineering Program (STEP) September 1980 through September 1983 [PB84-144260] p 29 N84-21765
- LEVIS, A. H.**
Modeling and analysis of teams of interacting decisionmakers with bounded rationality p 13 A84-21644
- LEVITSKIY, L.**
Lack of support for introduction of Soviet inventions scored p 62 N84-11042
- LEVY, M. E.**
Financing large space projects p 67 A84-15321
- LEWIS, D. L.**
Improving the air traffic control system: An assessment of the National Airspace System Plan p 80 N84-16160
- LIAO, S. S.**
Contractor 'Hungriness' and the relative profitability of DoD business [AD-P002796] p 74 N84-23342
- LICHTENSTEIN, S.**
Socialist versus individual decision making: How they might differ [IZF-1983-20] p 18 N84-22166
- LIEBER, R. S.**
The Score technique: An analytical approach for assessing the results of manufacturing reviews [AD-P002838] p 30 N84-23383
- LIENTZ, B. P.**
Issues in software maintenance [AD-A130622] p 40 N84-10786
- LINDQUIST, T. E.**
GENIE: A computer-based task for experiments in human-computer interaction [AD-A137473] p 3 N84-20181
- LIPPIATT, T. F.**
A development of logistics management models for the Space Transportation System [NASA-CR-173504] p 84 N84-23664
- LOCKE, T. N.**
Manufacturing methods and technology, CAM (Computer Aided Manufacturing) related projects, FY 83-85 [AD-A136572] p 33 N84-18924
- LOCKETT, K. V.**
The simulation of a major Automated Information System (AIS) on a microcomputer [AD-A143589] p 59 N84-34323
- LOCKHART, G.**
Benchmarking unstructured systems [DE83-011175] p 15 N84-14969
- LOESH, R.**
Ada and the NASA software environment p 43 N84-14749
- LOEVE, W.**
The influence of Computer Aided Design (CAD) on research [NLR-MP-83026-U] p 36 N84-31984
- LONG, J. A.**
Life cycle costing in a dynamic environment [AD-A133023] p 70 N84-14967
- LOUGHNAME, L.**
Prototype development of an information-sharing and decision support system for the manpower personnel and training community [AD-P003310] p 8 N84-28451
- LOWRY, I. S.**
Designing readable and reusable tables [RAND/P-6945] p 51 N84-24496
- LUCHSINGER, V.**
Behavioral issues in the management of technology [AD-P003349] p 9 N84-28467
- LUSK, E. L.**
Tools for the creation of IMS database designs from Entity-Relationship diagrams [DE84-000592] p 42 N84-14066

M

- MACINTOSH, N. B.**
The nature and use of formal control systems for management control and strategy implementation [AD-A139083] p 20 N84-24493
- MADAUSS, B. J.**
Profitability improvement of projects by early consideration of life cycle cost reduction [MBB-UR-620-83-O] p 76 N84-24495
- Project management in the 80's [MBB-UR-631-83-O] p 65 N84-26454
- MADAUSS, B.-J.**
Project management in the '80s [MBB-UR-631-83-OE] p 61 A84-22854

- MAGLARIS, B.**
Research in network management techniques for tactical data communications networks
[AD-A131357] p 40 N84-11365
- MAGNANTI, T. L.**
Worst case performance of some heuristics for lot size problems
[INPE-3134-PRE/525] p 78 N84-34205
- MAHOY, J. O.**
Contractor fraud: Government response
[AD-P002833] p 101 N84-23378
- MAIN, H. A.**
Training acquisition personnel through a local college
[AD-P002766] p 6 N84-23313
- MAJCHRAZAK, A.**
Computer-automated technological innovation in three manufacturing sectors
[AD-P003309] p 35 N84-28450
- MAJEWSKI, W. D.**
Project: Acquisition strategy
[AD-P002809] p 83 N84-23355
- MAJID, A. A.**
Impact of current U.S. policy on international civil aviation
p 97 A84-20675
- MALLET, E.**
ESA and its programs: Present and future
p 66 N84-34716
- MAMRAK, S.**
Special or general purpose end-to-end transport mechanisms in distributed systems: One view
[DE84-008297] p 51 N84-25367
- MANE, A.**
Psychophysiological tools in engineering psychology
[AD-P003337] p 8 N84-28461
- MANGUM, W. C.**
Reliability programs for nonelectronic designs, volume 1
[AD-A133624] p 91 N84-14529
- MANSFIELD, E.**
'Reverse' transfers of technology from overseas subsidiaries to American firms
p 61 A84-42620
- MARCUS, A.**
Computer-assisted information graphics from the graphic design perspective
[DE84-006059] p 48 N84-22281
- MARCY, S. C.**
Exploring the interaction of the Vroom/Yetton model and leadership style (LPC) (Least Preferred Coworker) as it predicts performance
[AD-P003247] p 22 N84-28414
- MARGRAVE, G.**
Tools for the creation of IMS database designs from Entity-Relationship diagrams
[DE84-000592] p 42 N84-14066
- MARRIE, M. D.**
Automated administrative data bases
p 47 N84-21411
- MARSH, N.**
Computers for the smaller contractors
p 28 N84-14703
- MARSHAK, R.**
Human engineering guidelines for management information systems. Change 1
[AD-A137808] p 4 N84-21104
- MARTIN, B. A.**
Training decision-makers to be creative: A management process model
[AD-P003347] p 22 N84-28466
- MARTIN, C.**
Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, volume 4: Composite information model of design product (DES 1)
[AD-A142447] p 36 N84-30774
Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1)
[AD-A143072] p 36 N84-31973
- MARTIN, J. M.**
Control systems
[AD-A140901] p 21 N84-27592
- MARTIN, M. D.**
The impact of factory automation and robotics on the contracting and acquisition processes
[AD-P002830] p 34 N84-23375
- MARTIN, R. J.**
Guidance on software maintenance
[PB84-128951] p 45 N84-18952
- MARYENKO, B. S.**
Realization of human work capacity: Interdisciplinary problems
p 10 N84-31920
- MAURO, C. A.**
Research on factor screening in computer simulation
[AD-A139825] p 20 N84-25353
- MAURO, P. A.**
Hughes' software engineering procedures improve quality - Do they help productivity?
[AJAA PAPER 83-2357] p 88 A84-10027
- MAYNARD, J. F.**
GENIE: A computer-based task for experiments in human-computer interaction
[AD-A137473] p 3 N84-20181
- MCALLISTER, P. R.**
Further delineation of the utilization of scientific literature by U.S. patents
[PB84-100734] p 100 N84-18095
- MCCABE, E. J.**
Relevant and irrelevant legal structures: Distinguishing private sector from DOD contracting
[AD-P003241] p 102 N84-28408
- MCCANN, P. H.**
Methods for improving the user-computer interface
[AD-A132657] p 2 N84-14713
- MCCANN, T. M.**
Increasing spares competition in AFLC (Air Force Logistics Center)
[AD-P002775] p 81 N84-23322
Increasing competition for spares within AFLC (Air Force Logistics Command)
[AD-A140751] p 85 N84-27588
- MCCARRON, W. E.**
Leadership, managership, and computers in today's Air Force
[AD-P003351] p 22 N84-28468
- MCCARTHY, J. L.**
Proceedings of the 2nd International Workshop on Statistical Database Management
[DE84-005866] p 52 N84-25522
- MCCASKILL, G. T.**
Logistic support: A computer manufacturer's viewpoint
[AD-P003496] p 87 N84-32262
- MCCRHYSTAL, D. L.**
The new MIL-STDs (Military standard) 1388
[AD-P002806] p 82 N84-23352
- MCCLENNON, P. R.**
A strategy for improving overhead cost control
[AD-A134661] p 71 N84-18092
- MCDONNELL, R. M.**
Exploring the interaction of the Vroom/Yetton model and leadership style (LPC) (Least Preferred Coworker) as it predicts performance
[AD-P003247] p 22 N84-28414
- MCDONALD, G. C.**
On using selection procedures with binomial models
[AD-A135275] p 16 N84-17957
- MCGARRY, F.**
Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150
- MCGEE, R. H.**
Sandia National Laboratories administrative data processing systems
[DE84-014328] p 59 N84-34202
- MCGOVERN, W. M.**
Economic production rate study
[AD-P002793] p 74 N84-23340
- MCKENNEY, R. L., JR.**
Guide to Canadian aerospace related industries
[AD-A140606] p 30 N84-26650
- MCKINNEY, B. J.**
US military aircraft cost handbook
[AD-A136035] p 71 N84-18158
The problem of cost growth
[AD-P002792] p 74 N84-23339
- MCNEE, R. C.**
Organizational-climate dimensions: A conceptual and judgmental analysis
[AD-A132898] p 15 N84-16068
A set of organizational-climate measures: Internal consistency, factor structure, and predictive power
[AD-A135352] p 16 N84-19132
- MCNICHOLS, G. R.**
US military aircraft cost handbook
[AD-A136035] p 71 N84-18158
The problem of cost growth
[AD-P002792] p 74 N84-23339
- MEADOWS, B. F.**
Use of microcomputers for inventory management with uncertain demand
[DE84-005179] p 81 N84-21112
- MEINERS, A. C., JR.**
Improving the effectiveness of award fee contracts for program management support services
[AD-P002827] p 75 N84-23372
- MEISTER, D.**
Guide to the development of a human factors engineering data retrieval system
[AD-A136918] p 4 N84-20187
- MELNIKOV, A.**
Trade agreements on know-how discussed
p 70 N84-10349
- MENTER, M.**
Legal aspects of commercial space activities
p 99 A84-44852
- MERRILL, D. R.**
Naval aviation IMA repair capability: A readiness to resources approach
[AD-A140465] p 84 N84-25612
- MERSON, A. L.**
Scientists discuss increased production with fewer workers
p 26 N84-10356
- MICALIZZI, J.**
The structure of processing resource demands in monitoring automatic systems
[AD-P003319] p 8 N84-28455
- MIGHT, R.**
An evaluation of the effectiveness of project control systems
p 61 A84-242621
- MIKHAYLOV, F.**
Robotics impact on labor productivity examined
p 35 N84-24104
- MILLEMANN, N. T.**
Proceedings of the 1982 Integrated Data Users Workshop
[DE83-014761] p 40 N84-11066
- MILLER, C. D.**
Q-GERT model of the contracting cycle
[AD-A135639] p 16 N84-19127
- MILLER, C. O.**
System safety in aircraft acquisition
[AD-A141492] p 95 N84-28763
- MILLS, M. P.**
Software configuration management and its contribution to reliability program management
p 89 A84-15217
- MITCHELL, J. L.**
Profit responsibilities in the simulation and training equipment industry
[AD-P003497] p 77 N84-32263
- MITCHELL, I. R.**
Sandia National Laboratories administrative data processing systems
[DE84-014328] p 59 N84-34202
- MITCHELL, T. J.**
Two-level compromise designs for estimating main effects and detecting interactions
[DE84-002997] p 16 N84-18094
- MITTLEMAN, A. N.**
Manual for implementing a Shared Time Engineering Program (STEP) September 1980 through September 1983
[PB84-144260] p 29 N84-21765
- MOHRMAN, A. M., JR.**
Performance appraisal revisited
[AD-A132841] p 3 N84-16059
Motivation and performance appraisal behavior
[AD-A134311] p 3 N84-17842
- MOLODTSOVA, V. I.**
Significance of allowing for individual differences in organizing the work shift in monotonous production work
p 2 A84-32353
- MOORE, J. T.**
INTERACT execute facility for job scheduling and manipulation
[DE84-001653] p 43 N84-14968
- MOORE, R. T.**
Gridnet - An alternative large distributed network
p 39 A84-31351
- MORAN, D. D.**
Cost estimation of research and development projects
[ASME PAPER 83-WA/MGT-4] p 69 A84-30646
- MORGAN, B. B., JR.**
Assessment of learning abilities using rate measures
[AD-P003340] p 8 N84-28463
- MORGAN, D. E.**
Information needs and system specifications for the B-1B executive information system
[AD-A134424] p 45 N84-17054
- MORGAN, D. M.**
1982 US Army Materiel Development and Readiness Command (DARCOM) integrated logistic support (ILS) study finding on contracting for ILS
[AD-P002805] p 82 N84-23351
- MORGAN, E. B., JR.**
An exploratory study of the use of an inexpensive cordless telephone as a part of a data communications link
[AD-A134228] p 44 N84-16432
- MORGAN, T. W.**
Engineering tradeoff problems viewed as multiple objective optimizations and the VODCA methodology
p 13 A84-31213
- MORIARTY, T. M.**
Software progress tracking system
[AD-P003488] p 57 N84-32255

- MORRIS, M. D.**
Two-level compromise designs for estimating main effects and detecting interactions
[DE84-002997] p 16 N84-18094
- MORRISON, J. M.**
Management information system for engineering
[DE84-001655] p 28 N84-14984
- MORROW, C. L.**
Some technical and contractual aspects of transponder leasing by EUTELSAT
p 79 A84-20645
- MORSE, A. C.**
A system for embedding data displays in graphical contexts
[AD-A143630] p 24 N84-34191
- MOSTINI, G.**
Integrated Software Engineering Facilities (ISEF)
p 42 N84-14730
- MOTSCHNIG, H.**
EDDA: A very high level data flow specification language
p 42 N84-14735
- MOYER, R.**
US military aircraft cost handbook
[AD-A136035] p 71 N84-18158
- MUCCI, J. H.**
Automated storage and retrieval systems--a consolidation of guidance for project management and implementation
[AD-A135571] p 80 N84-19175
- MUELLER-ROSTIN, W. D.**
Product liability in aviation and its insurability
p 96 A84-11311
- MULLER, J. C.**
Text processing in the writing of contracts
[SNIAS-841-422-102] p 65 N84-32297
- MURPHREE, E. L., JR.**
Models of purposive human organization: A comparative study
[AD-A138871] p 19 N84-24491
- MURPHY, R. L.**
Cost risk and contract type: A normative model
[AD-P002781] p 73 N84-23328
- MURREL, S. L.**
The impact of communicating through computers
p 53 N84-27457
- MUZYBYAEV, K.**
The influence of forms of work organization on personal responsibility in production work
p 1 A84-14981
- MYERS, J. R.**
Emerging government regulation of American space entrepreneurs
[AAS PAPER 83-227] p 99 A84-29870
Federal government regulation of commercial operations using expendable launch vehicles
p 99 A84-43365
- MYERS, M. G.**
Analysis of incentives for productivity-enhancing investment
[AD-P002770] p 73 N84-23317
- N**
- NARASIMHAN, B.**
Design of office information systems
[AD-A136523] p 46 N84-19170
- NARIN, F.**
Further delineation of the utilization of scientific literature by U.S. patents
[PB84-100734] p 100 N84-18095
- NEBEKER, D. M.**
Productivity improvement in a purchase division: Evaluation of a Performance Contingent Reward System (PCRS)
[AD-A133589] p 71 N84-16801
- NEPOMUCENO, L. X.**
Techniques of condition monitoring and fault diagnosis in industry
p 27 N84-13595
- NEUBERGER, B. M.**
Productivity improvement in a purchase division: Evaluation of a Performance Contingent Reward System (PCRS)
[AD-A133589] p 71 N84-16801
- NEUGENT, W.**
Guideline for computer security certification and accreditation. Category: ADP (Automatic Data Processing) operations. Subcategory: Computer security. Federal information processing standards
[FIPS-PUB-102] p 55 N84-30736
- NG, E. W.**
Ada and the NASA software environment
p 43 N84-14749
- NICHOLS, R. G.**
The creation of a central database on a microcomputer network
[AD-A143875] p 59 N84-34326

- NICKOLAS, G. T.**
Paperless solicitation and contracting
[AD-P002749] p 49 N84-23296
- NIEVA, V. F.**
Computer-automated technological innovation in three manufacturing sectors
[AD-P003309] p 35 N84-28450
- NIKOLAS, G. T.**
Training requirements for changing times
[AD-P002764] p 5 N84-23311
- NIXON, S. R.**
Commercialization of opportunities for materials processing in low gravity
[NASA-CR-170953] p 71 N84-15165
- NORCIO, A. F.**
Accuracy of software development activity data: The software cost reduction project
[AD-A137639] p 71 N84-21122
- NORTON, M. G.**
A survey of contractor productivity measurement practices
[AD-P002831] p 76 N84-23376
- NORWOOD, D. L.**
ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing. Volume 4, part 5, task D: Quality assurance/quality, control/technical requirement/tasks, quality assurance modeling and analysis, architecture for product assurance, (TTD)
[AD-A144691] p 37 N84-34999
- NOWLIN, A.**
Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1)
[AD-A143072] p 36 N84-31973
- O**
- O'CONNOR, D. J.**
Local automation model: System specification
[AD-A141503] p 54 N84-29798
- OLIVER, L. W.**
An overview of productivity improvement efforts in Army organizations
[AD-A138589] p 19 N84-24490
Research integration: An essential for Department of Defense psychological research
[AD-P003366] p 65 N84-28479
- OLSGAARD, J. N.**
The relationship between administrative style and the use of computer-based systems: An attitudinal study of academic library professionals
p 11 N84-32276
- OLSON, R. J.**
Proceedings of the 1982 Integrated Data Users Workshop
[DE83-014761] p 40 N84-11066
- OLSONI, K. E.**
Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 3
[AD-A131878] p 27 N84-12051
Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 2
[AD-A131877] p 27 N84-12052
Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary
[AD-A131876] p 27 N84-12053
- OMALLEY, T. J.**
The aircraft availability model: Conceptual framework and mathematics
[AD-A132927] p 79 N84-14115
- ONEIL, M. E.**
The simulation of a major Automated Information System (AIS) on a microcomputer
[AD-A143599] p 59 N84-34323
- ORLANDSKY, J.**
Determining cost and training effectiveness tradeoffs for trainer design: Test of an experimental model
[AD-P003455] p 10 N84-32232
- ORNDORFF, M. S.**
Evaluation of automated configuration management tools in ADA programming support environments
[AD-A140982] p 53 N84-28666
- OSATYUK, Y.**
Use of economic mechanisms in managing scientific and technical progress
p 76 N84-23389
- OSBORN, J. D.**
CAD/CAM technology working group report IDA/OSD R/M (Institute for Defense Analyses/Office of the Secretary of Defense Research and Maintainability) study
[AD-A137761] p 33 N84-20867
- OSBORNE, W. M.**
Guidance on software maintenance
[PB84-128951] p 45 N84-18952

- OSHAUGHNESSY, S. F.**
Computer Generated Acquisition Document System (CGADS)
[AD-P002784] p 50 N84-23331
- OSTER, C. V., JR.**
Deregulation and commuter airline safety
p 99 A84-36942
- OVERBEEK, R. A.**
Tools for the creation of IMS database designs from Entity-Relationship diagrams
[DE84-000592] p 42 N84-14066
- OXMAN, J.**
Prototype development of an information-sharing and decision support system for the manpower personnel and training community
[AD-P003310] p 8 N84-28451

P

- PADEN, V. L.**
Organizational-climate dimensions: A conceptual and judgmental analysis
[AD-A132898] p 15 N84-16068
A set of organizational-climate measures: Internal consistency, factor structure, and predictive power
[AD-A135352] p 16 N84-19132
- PAGE, J.**
Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150
- PALMER, P. R., JR.**
US military aircraft cost handbook
[AD-A136035] p 71 N84-18158
- PARIS, G.**
Concerted effort for nationwide computer literacy
p 4 N84-22357
- PARK, A. B.**
New opportunities for the private sector in space technology
p 69 A84-49145
- PARKER, E.**
Computer science and technology: Microcomputer: A review of federal agency experiences
[PB83-238972] p 41 N84-11772
- PARKISON, S. C.**
Age effects on active duty Army MMPI (Minnesota Multiphasic Personality Inventory) profiles
[AD-P003343] p 9 N84-28464
- PARSONS, E.**
Consolidation of DOD bidder's mailing list application
[AD-P002752] p 81 N84-23299
- PATTERSON, J. C.**
Psychological and biochemical effects of a stress management program
[AD-P003300] p 7 N84-28447
- PAYNE, D. L.**
Individual differences in learning rate
[AD-P003338] p 8 N84-28462
- PEARSON, A. W.**
The effectiveness of project managers - Implications of a political model of influence
p 14 A84-42622
- PEARSON, D. J.**
Guide to Canadian aerospace related industries
[AD-A140606] p 30 N84-26650
- PEER, J. E.**
The new MIL-STDs (Military standard) 1388
[AD-P002806] p 82 N84-23352
- PEPE, J. T.**
The evolution of the JOVIAL/J73 language from definition to use
[AD-P003518] p 56 N84-31122
- PEPINO, B.**
AMIX: An automated system for handling error notification data
p 91 N84-14734
- PEPPER, R. L.**
NQSC (Naval Ocean Systems Center)-Hawaii perceptual sciences research program
[AD-P003361] p 9 N84-28474
- PETERSEN, K. L.**
Software control and system configuration management - A process that works
p 38 A84-26713
Software control and system configuration management: A systems-wide approach
[NASA-TM-85908] p 56 N84-31112
- PETITDEMANGE, C.**
Design to cost
p 25 A84-15319
- PFEIFFER, B. R. K.**
The Spacelab program - The management of the program, problems encountered and the solutions adopted
p 60 A84-15325
- PFEIFROTH, F.**
The project library PLUS: A general overview
p 43 N84-14751
- PHELINES, R. F.**
Integrated budget control using a desktop computer
p 70 N84-14697

PHILIPS, D.

Now: An initial approach to collection of major material systems actual costs
[AD-A139845] p 76 N84-25505

PICCIAU, G.

AMIX: An automated system for handling error notification data p 91 N84-14734

PIERSON, W.

Psychological and biochemical effects of a stress management program
[AD-P003300] p 7 N84-28447

PILZ, W.-D.

Methods and operational means for project management
[MBB-UR-673-84-OE] p 61 A84-35922

PINELLI, T. E.

Preferences on technical report format - Results of a survey p 39 A84-33153
The function of report components in the screening and reading of technical reports p 40 A84-45547
Report format preferences of technical managers and nonmanagers p 40 A84-45572

PIOTROWSKI, T.

A program for developing automated scientific-information processing in maritime economy
[AD-A135518] p 45 N84-18107

PITRIK, R.

EDDA: A very high level data flow specification language p 42 N84-14735

PLUMMER, O. R.

The database management system: A topic and a tool p 48 N84-22316

POCALYKO, P. N.

Defense industry attitudes about AF interface standards report of an electronics industries association survey
[AD-P003570] p 95 N84-31175

POENSGEN, O. H.

R&D management and financial performance p 61 A84-15598

POGUDIN, P.

Use of economic mechanisms in managing scientific and technical progress p 76 N84-23389

POPOV, G.

Scientist discusses problems in introducing new technology p 62 N84-10357

POST, J. V.

Software quality measurement for distributed systems, volume 1
[AD-A137955] p 92 N84-21128
Software quality measurement for distributed systems. Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129
Software quality measurement for distributed systems. Volume 3: Distributed computing systems. Impact on software quality
[AD-A137957] p 92 N84-21130

POSTON, R. M.

Implementing software productivity measures
[AIAA PAPER 83-2360] p 66 A84-10029

POWELL, P. B.

Software engineering project standards p 90 A84-24450

PRATT, B. G.

Automating the source selection process
[AD-P002835] p 84 N84-23380

PRESS, L.

Microcomputers: Introduction to features and uses
[PB84-178821] p 53 N84-27456

PRESSON, P. E.

Software quality measurement for distributed systems, volume 1
[AD-A137955] p 92 N84-21128
Software quality measurement for distributed systems. Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129
Software quality measurement for distributed systems. Volume 3: Distributed computing systems. Impact on software quality
[AD-A137957] p 92 N84-21130

PRESTON, R. R.

ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing. Volume 4, part 5, task D: Quality assurance/quality control/technical requirement/tasks, quality assurance modeling and analysis, architecture for product assurance, (TTD)
[AD-A144691] p 37 N84-34999

PREWETT, R.

Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 7: MFG01 glossary
[AD-A144426] p 36 N84-34991

PRICE, C. H., JR.

HQ AFSC selection of a microprocessor development system
[AD-A134930] p 45 N84-17891

PRICE, H. E.

A review of major issues relating to human-machine integration in the development of military systems
[AD-A136739] p 3 N84-20184

An introduction to human factors for engineering managers: Framework for a teaching unit
[AD-A135958] p 4 N84-20428

PRUITT, G.

Assessment of the NASA Flight Assurance Review Program
[NASA-CR-173418] p 94 N84-23401

PURSCH, W. C.

Nailing down the liability issue once and for all
[AD-P002777] p 101 N84-23324

Q

QIAN, F.

Network analysis utilizing computer graphics p 14 A84-31781

QUAGLIANA, M.

Motivating managers: A guide to performance targeting and performance-based pay in state and local governments
[PB83-237834] p 14 N84-11978

QUINT, B. E.

Scientific and technical information transfer: Issues and options
[RAND/N-2131-NSF] p 65 N84-33286

R

RADOSEVICH, J. D.

NASA Administrative Data Base Management Systems, 1984
[NASA-CP-2323] p 58 N84-33266

RADOSEVICH, R.

Needs assessment for support units in an R & D organization p 61 A84-31214

RAELIN, J. A.

Factors explaining decisions to terminate or continue an R and D project, executive summary
[PB83-256602] p 63 N84-14971

Factors explaining decisions to terminate or continue an R and D project
[PB83-256594] p 63 N84-14972

RAMAKRISHNA, K.

An intelligent manual for price analysis
[AD-P002798] p 75 N84-23344

The design of an expert system for contract price analysis
[AD-A140927] p 77 N84-28662

RAMAKRISHNA, K.

Expert systems for price analysis: A feasibility study
[AD-P002795] p 74 N84-23341

RAMO, S.

The practical dimensions of space p 69 A84-38947

RAMPILLON, A.

Configuration and documentation management p 38 A84-15309

RAY, J. L.

Evaluation of the BCT (Basic Cadet Training) paraprofessional counselor training at the United States Air Force Academy
[AD-P003244] p 7 N84-28411

REEVES, A. D.

The industrial modernization incentives program: An experimental effort to improve defense contractor productivity
[AD-P002771] p 29 N84-23318

REGAZZI, J. J., III

A study of critical factors affecting the development of performance measures in evaluating bibliographic information retrieval systems p 41 N84-13030

REGULINSKI, T. L.

Reliability cost estimation - Managerial perspectives p 66 A84-15215

REISING, S. A.

Automated administrative data bases p 47 N84-21411

RESNICK, S. M.

Performance appraisal revisited
[AD-A132841] p 3 N84-16059

REYNOLDS, J. F.

Mobilization and defense management technical reports series. Management implications of industrial support capabilities for Space Shuttle operations
[AD-A137460] p 81 N84-19390

RIBEIRO, M. L.

SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512

RICHARDS, L.

Prototype development of an information-sharing and decision support system for the manpower personnel and training community
[AD-P003310] p 8 N84-28451

RICHARDSON, W. E.

Formal techniques in the management of software design
[AD-A132569] p 42 N84-13818

RIEGLE, N. N.

Improving system affordability
[AD-A142387] p 77 N84-31062

RIJN, P. V.

An overview of productivity improvement efforts in Army organizations
[AD-A138589] p 19 N84-24490

RIPKEN, K.

Coherent management support in the Ada environment p 43 N84-14748

ROBINSON, D.

Employment changes resulting from the award of contracts in labor surplus areas
[AD-P002834] p 83 N84-23379

ROBINSON, D. G.

Planning for reliability growth
[AIAA PAPER 83-2776] p 88 A84-12356

ROBLES, F.

Needs assessment for support units in an R & D organization p 61 A84-31214

ROEDER, G. L.

A cost based acquisition planning model utilizing expert system concepts
[AD-P002783] p 73 N84-23330

Computer Generated Acquisition Document System (CGADS)
[AD-P002784] p 50 N84-23331
Computer Aided Source Selection (CASS)
[AD-P002785] p 50 N84-23332

ROESLER, G. E.

Economic production rate study
[AD-P002793] p 74 N84-23340

ROMAN, G.-C.

A total system design framework p 39 A84-41201

ROMEIO, A.

'Reverse' transfers of technology from overseas subsidiaries to American firms p 61 A84-42620

RONCHI, S.

The role of quality assurance in the development of software for space applications p 91 N84-14743

RONE, K. Y.

Projecting manpower to attain quality p 5 N84-23148

ROSALES, R. J., JR.

Determination of factors affecting performance and productivity in an engineering/design environment
[AD-A143315] p 11 N84-33252

ROSE, B.

Contracting initiative: Best proposal for price
[AD-P002782] p 73 N84-23329

ROSE, J. T.

Role of a space station in pharmaceutical manufacturing p 25 A84-24632

ROSELLE, P. F.

The occupational interests of R&D managers and technical specialists - Some preliminary findings
[AD-A143315] p 61 A84-23988

ROSEN, J. M.

An innovative approach to supplier cost control p 69 A84-46348

ROSENBERG, L.

Evaluation of the HARDMAN comparability methodology for manpower, personnel and training
[NASA-CR-173733] p 9 N84-28485

ROSENTHAL, L.

Computer science and technology: Microcomputer: A review of federal agency experiences
[PB83-238972] p 41 N84-11772

ROSS, A. A.

Computer system design environment software development plan
[AD-A131651] p 41 N84-12747

ROTHBLATT, M. A.

A legal charter for non-governmental space industrialization
[AAS PAPER 83-225] p 98 A84-29868

RUCK, H. W.

Safety training priorities
[AD-A141711] p 95 N84-29026

RUEGSEGGGER, T.

Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 5: Composite function model of manufacture product (MFG0)
[AD-A142337] p 35 N84-30766

- Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1)
[AD-A143072] p 36 N84-31973
- RUIZ, W.**
Difficulties of scientific and technological planning
[INPE-2786-PRE/352] p 24 N84-34308
- RUSSEL, J. H.**
Corporate DP planning: New approaches and new concerns
[PNR-90180] p 50 N84-23386
- RUSSO, A. J.**
Quality Assurance (QA) procedures for computer software in department 1510
[DE84-012131] p 95 N84-30778
- RUTHBERG, Z. G.**
Guideline for computer security certification and accreditation. Category: ADP (Automatic Data Processing) operations. Subcategory: Computer security. Federal information processing standards
[FIPS-PUB-102] p 55 N84-30736
- RYDER, D. E.**
Management of QA in an R and D organization
[DE83-016924] p 90 N84-13014
- RYTTER, L. J.**
Managing a low quantity, high technology trainer development program
[AD-P003464] p 11 N84-32241
- S**
- SAGE, A. P.**
ARIADNE - A knowledge-based interactive system for planning and decision support
p 14 A84-33463
- SAKAMOTO, T.**
Aircraft accident investigation procedures in Japan
p 98 A84-27410
- SAKSIDA, M. F.**
The economics of computerized information dissemination
p 77 N84-28678
- SAMUEL, S.**
Reliability program development and implementation for a remote piloted vehicle
p 88 A84-15208
- SANDERS, J. L.**
Equitable assignment rules
[AD-A142809] p 24 N84-32268
- SANDERS, L. W.**
Multiyear subcontractor selection criteria analysis
[AD-A135638] p 80 N84-19126
- SAPP, J. K.**
A calculator adaptation of the Markov chain model for manpower analysis
[AD-A132990] p 15 N84-14966
- SARACHIK, P.**
Research in network management techniques for tactical data communications networks
[AD-A131357] p 40 N84-11365
- SARASON, I. G.**
Social support and performance in complex organizations
[AD-A138888] p 6 N84-24098
- SAWYER, C. R.**
A review of major issues relating to human-machine integration in the development of military systems
[AD-A136739] p 3 N84-20184
An introduction to human factors for engineering managers: Framework for a teaching unit
[AD-A135958] p 4 N84-20428
- SCHAEFER, M. K.**
A multi-item maintenance center inventory model for low-demand repairable items
p 79 A84-45666
- SCHANTZ, R. E.**
A technical overview of the National Software Works
[AD-A132320] p 42 N84-13827
- SCHKADE, D.**
The human side of robotics: Results from a prototype study on how workers react to a robot
[AD-A133438] p 33 N84-15805
- SCHMERLING, E. R.**
A user view of office automation or the integrated workstation
p 58 N84-33271
- SCHMIDT, R. L.**
Software quality measurement for distributed systems, volume 1
[AD-A137955] p 92 N84-21128
Software quality measurement for distributed systems. Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129
Software quality measurement for distributed systems. Volume 3: Distributed computing systems. Impact on software quality
[AD-A137957] p 92 N84-21130
- SCHNECK, P.**
NASA-wide standard administrative systems
p 48 N84-21415
- SCHULTZ, G. W.**
PROJMMG FORTRAN: An interactive computer program for use with the defense management simulation exercise
[AD-A140709] p 53 N84-27472
- SCHULTZ, H.**
Software Cost Estimation Workshop report
[AD-A139840] p 51 N84-25354
- SCHUTT, H. J.**
Program Manager's Support System (PMSS): An update
[AD-P002825] p 50 N84-23370
- SCHWIERING, D. A.**
Decision theory: Individual biases and their effect on forecasting in an organization
[AD-A137943] p 17 N84-21395
- SCHWING, R. L.**
Data base management of software development
[AD-P003486] p 57 N84-32253
- SCONTRINO, M. P.**
Physical performance tests as predictors of task performance
[AD-P003257] p 7 N84-28424
- SECRIST, G. E.**
Organizational-climate dimensions: A conceptual and judgmental analysis
[AD-A132898] p 15 N84-16068
A set of organizational-climate measures: Internal consistency, factor structure, and predictive power
[AD-A135352] p 16 N84-19132
- SEE, R. M.**
Assessing contracting workforce requirements in the matrix organization
[AD-P002760] p 5 N84-23307
- SENNEWALD, P. F.**
Study of the FAA (Federal Aviation Administration) program to modernize maintenance operations
[AD-A142295] p 86 N84-29848
- SEQUIN, C.**
Design and performance of a distributed relational data base system
[AD-A142177] p 54 N84-29495
- SERRE, P.**
Information search in judgment tasks: The effects of unequal cue validity and cost
[AD-A141712] p 23 N84-29437
- SHAKIROV, K.**
Use of scientific potential in industry discusses
p 26 N84-10353
- SHANNON, J. T.**
Decision theory: Individual biases and their effect on forecasting in an organization
[AD-A137943] p 17 N84-21395
- SHAPIRO, N. Z.**
Interactive information environments: A plan for enabling interdisciplinary research
[RAND/N-2115] p 58 N84-33284
- SHEPHERD, B. R.**
ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing. Volume 4, part 5, task D: Quality assurance/quality, control/technical requirement/tasks, quality assurance modeling and analysis, architecture for product assurance, (TTD)
[AD-A144691] p 37 N84-34999
- SHERIDAN, T. B.**
Interaction of human cognitive models and computer-based models in supervisory control
[AD-A142677] p 23 N84-30717
- SHINGLEDECKER, C. A.**
Development and application of a criterion task set for workload metric evaluation
[SAE PAPER 831419] p 1 A84-29482
- SHKABARDNYA, M.**
Industry official on progress in Soviet robotics program
p 35 N84-23915
- SHORT, L. O.**
A field study of Air Force organization structures
[AD-A142389] p 23 N84-31035
- SHPINER, L.**
Planning the use of robots
p 32 A84-42760
- SHUFORD, A.**
Computer generation of plan of action and milestone schedule
[AD-A137057] p 46 N84-20244
- SIA, E. B.**
Communication networks
p 58 N84-33356
- SILVERMAN, B. G.**
Analogy in systems management - A theoretical inquiry
p 13 A84-25008
- SIMANOVSKY, S.**
The socialist and developing countries: Technology transfer
p 62 N84-11035
- SIMKINS, D. J.**
Software performance modeling and management
p 89 A84-15218
- SINGER, M. J.**
Research issues in training device design: The organization of a data base
[AD-A140815] p 6 N84-26710
- SINHA, A. N.**
The O'Hare Runway Configuration Management System
p 79 A84-44732
- SIQUEIRA, V. L.**
SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512
- SISSON, C. E.**
Quality Assurance (QA) procedures for computer software in department 1510
[DE84-012131] p 95 N84-30778
- SKALL, M.**
Guide to software conversion management
[PB84-118314] p 45 N84-18945
- SKELLEY, L. J.**
Guide to reporting time in the financial information system at ANL
[DE84-009356] p 6 N84-25524
- SKEWIS, W. H.**
Reliability programs for nonelectronic designs, volume 2
[AD-A133625] p 91 N84-14528
Reliability programs for nonelectronic designs, volume 1
[AD-A133624] p 91 N84-14529
- SKOBLIKOV, Y. A.**
Effects of science, technology on structure of production process
p 26 N84-10351
- SMART, M. J.**
Manufacturing information system
[AD-A137891] p 33 N84-20730
- SMITH, D. E.**
Research on factor screening in computer simulation
[AD-A139825] p 20 N84-25353
- SMITH, D. V.**
Contract audit followup: Its impact on defense contracting
[AD-A140627] p 85 N84-27587
- SMITH, E. E.**
Applied cognitive science
[AD-A136780] p 4 N84-20185
- SMITH, G. A.**
Space commercialization
[GPO-26-498] p 71 N84-17194
- SMITH, M. S.**
Policy and legal issues involved in the commercialization of space
[GPO-21-495] p 100 N84-11069
- SMITH, P. R.**
Manufacturing information system
[AD-A137891] p 33 N84-20730
- SMITH, S.**
Integrated Computer-Aided Manufacturing (ICAM) architecture part 3. Volume 1: Architecture part 3: Accomplishments
[AD-A134249] p 33 N84-16829
Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 5: Composite function model of manufacture product (MFG0).
[AD-A142337] p 35 N84-30766
Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, volume 4: Composite information model of design product (DES 1)
[AD-A142447] p 36 N84-30774
Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1)
[AD-A143072] p 36 N84-31973
- SMITH, T. R.**
Applying artificial intelligence to large networks
p 36 N84-31743
- SNYDER, M. A.**
An analysis of naval aviation configuration status accounting
[AD-A140473] p 84 N84-26460
- SNYDER, T. F.**
An analysis of naval aviation configuration status accounting
[AD-A140473] p 84 N84-26460
- SNYDER, W. V.**
Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text
p 39 A84-44325
- SOLOMON, D. H.**
Air carrier liability under deregulation
p 97 A84-25033
- SOMERS, I. A.**
An application of the causal-integrative model
[AD-P002786] p 18 N84-23333
- SPURLIN, O. L.**
Physical performance tests as predictors of task performance
[AD-P003257] p 7 N84-28424

- SRULL, D. W.**
Improved management of support resources
[AD-P002808] p 83 N84-23354
- ST. JOHN, B.**
Integrated Computer-Aided Manufacturing (ICAM) architecture part 3. Volume 1: Architecture part 3: Accomplishments
[AD-A134249] p 33 N84-16829
- ST. JOHN, W.**
Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 5: Composite function model of manufacture product (MFG0)
[AD-A142337] p 35 N84-30766
- ST. JOHN, W.**
Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1)
[AD-A143072] p 36 N84-31973
- STAHL, M. J.**
Identifying operative goals by modeling project selection decisions in research and development
p 12 A84-15599
- STAHLER, W. D.**
General Purpose Electronic Test Equipment (GPETE) acquisition considerations for automated calibration
[AD-A133865] p 91 N84-14709
- STAMPER, J. T.**
Evolution in aerospace engineering organisation
p 26 A84-32774
- STAPELBERG, L. S.**
Construction planning and control: Current practice and continuing challenges
p 28 N84-14706
- STAR, J. L.**
Applying artificial intelligence to large networks
p 36 N84-31743
- STARK, R. M.**
On 'Before' and 'After' cost comparisons
[AD-P002799] p 75 N84-23345
- STAROVIT, V. V.**
Incentives for new production discussed
p 102 N84-23388
- STEELE, S. A.**
Issues affecting software standards to ensure quality and productivity
[AIAA PAPER 83-2358] p 88 A84-10028
- STEIL, K.**
Motivating managers: A guide to performance targeting and performance-based pay in state and local governments
[PB83-237834] p 14 N84-11978
- STEINBERG, D. M.**
Experimental design: Review and comment
[AD-A139268] p 19 N84-24309
- STEVENS, W. M.**
Government liability under the Federal Tort Claims Act for negligent inspection and certification of aircraft
p 96 A84-20150
- STEWART, J. F.**
Project management techniques for highly integrated programs
[NASA-TM-86023] p 63 N84-14965
- STEWART, J. T., JR.**
Should there be a mortgage convention for space activity investors?
[IAF PAPER 82-IISL-52] p 67 A84-17063
- STEWART, T. J.**
Interactive decision analysis and modelling
[CSIR-TWISK-294] p 20 N84-25403
- STILWELL, G. H.**
Information needs and system specifications for the B-1B executive information system
[AD-A134424] p 45 N84-17054
- STOCKING, A.**
Productivity and the forging industry
p 28 N84-18448
- STOCKWELL, B.**
Space insurance - Issues and problems
p 96 A84-16892
- STODDARD, M. L.**
Modeling the user in intelligent user interfaces
[DE84-012664] p 2 N84-14795
- STONE, H. S.**
Computer research in Japan
p 39 A84-31347
- STROM-GUZOWSKI, K.**
Training decision-makers to be creative: A management process model
[AD-P003347] p 22 N84-28466
- STUCKI, M. J.**
A total system design framework
p 39 A84-41201
- SULLIVAN, P. D.**
Cost accounting standards: A time for government and industry action
[AD-P002767] p 72 N84-23314
- SUTTON, G. P.**
Introduction to flexible manufacturing systems: Their applications, classification, and opportunities
[DE83-017373] p 33 N84-13868

- SUTTON, J. R.**
Data organisations and their management
p 45 N84-17069
- SWALLOW, C. E., JR.**
Defense industry attitudes about AF interface standards report of an electronics industries association survey
[AD-P003570] p 95 N84-31175
- SWANK, R. P.**
DECISION TECHNOLOGY: The catalyst for acquisition improvement
[AD-P002755] p 18 N84-23302
- SWANSON, D. H.**
The government relationship to industry in technology transfer and development
[AD-P002772] p 29 N84-23319
- SWEENEY, J. L.**
Multi-year procurement a 'Team approach'
[AD-P002780] p 82 N84-23327
- SWEENEY, P. J.**
A dynamic personnel assignment model in the R and D environment
[AD-P002765] p 5 N84-23312

T

- TALBERT, L. R.**
Interactive information environments: A plan for enabling interdisciplinary research
[RAND/N-2115] p 58 N84-33284
- TALCOTT, J. W., JR.**
Reliability programs for commercial communication satellites
p 88 A84-15209
- TAMIR, Y.**
Reliability program development and implementation for a remote piloted vehicle
p 88 A84-15208
- TASSINARI, R.**
Value and competition
[SNIAS-832-501-101] p 76 N84-25504
- TAYLOR, B.**
Evolution of a source library system
[AIAA PAPER 83-2427] p 37 A84-10062
- TAYLOR, B. S.**
An evaluation of the system 2000 data base management system for use in major item system mapping
[DE84-013130] p 87 N84-32296
- TAYLOR, P. B.**
Study of the FAA (Federal Aviation Administration) program to modernize maintenance operations
[AD-A142295] p 86 N84-29848
- TAYLOR, R. L.**
Training decision-makers to be creative: A management process model
[AD-P003347] p 22 N84-28466
- THADATHIL, J.**
Optimization methods in hierarchical holographic modeling
p 20 N84-26001
- THALL, R. M.**
Configuration management with the Ada (trademark) language
[AD-P003416] p 55 N84-30748
- THAMHAIN, H. J.**
Managing engineers effectively
p 13 A84-15600
- THEEDE, E.**
Incentives for product quality need contract, cost, production and field co-operation
[AD-P002819] p 93 N84-23364
- THIEBAUT, W. M.**
Legal status of memoranda of understanding in the United States
p 99 A84-38475
- THIELEN, G. J.**
A quality improvement strategy for systems acquisition
[AD-P002820] p 94 N84-23365
- THIJS, W.**
Fault management
p 23 N84-30709
- THOMAS, D. M.**
Government - contractor interaction
[AD-P002768] p 63 N84-23315
- THOMAS, E. L., JR.**
Unified database development program
[AD-A140309] p 52 N84-26471
- THOMAS, J. J.**
ALDS project: Motivation, statistical database management issues, perspectives, and directions
[DE84-001412] p 44 N84-14983
- THOMAS, M. U.**
Optimum warranty policies for nonreparable items
p 89 A84-15216
- THOMAS, R. H.**
A technical overview of the National Software Works
[AD-A132320] p 42 N84-13827
- THOMPSON, N. A.**
Safety training priorities
[AD-A141711] p 95 N84-29026

- THRONE, R. H.**
The national air-space system contingency plan
p 78 A84-10416
- THURGOOD, R. L.**
Engineering tradeoff problems viewed as multiple objective optimizations and the VODCA methodology
p 13 A84-31213
- TINKHAM, M. T.**
The occupational interests of R&D managers and technical specialists - Some preliminary findings
p 61 A84-23988
- TIRRE, W. C.**
Individual differences in learning rate
[AD-P003338] p 8 N84-28462
- TTTOVA, N. A.**
Realization of human work capacity: Interdisciplinary problems
p 10 N84-31920
- TOGAI, M.**
Japan's next generation of robots
p 32 A84-31346
- TOMLINSON, J. P.**
An evaluation of the system 2000 data base management system for use in major item system mapping
[DE84-013130] p 87 N84-32296
- TOMPKINS, F. G.**
Guidelines for developing NASA (National Aeronautics and Space Administration) ADP security risk management plans
[NASA-CR-173564] p 52 N84-26317
- TOMPKINS, F. G.**
Guidelines for development of NASA (National Aeronautics and Space Administration) computer security training programs
[NASA-CR-173562] p 52 N84-26318
- TOMPKINS, F. G.**
Guidelines for contingency planning NASA (National Aeronautics and Space Administration) ADP security risk reduction decision studies
[PB84-189836] p 55 N84-30737
- TOUSSAINT, M.**
The workload of European space industry - Current situation and foreseeable trends
p 26 A84-38468
- TOWNSEND, W. B.**
Artificial intelligence techniques for industrial applications in job shop scheduling
[AD-A132164] p 32 N84-13867
- TRAEGER, R. K.**
Technology transfer revisited
[DE84-012233] p 65 N84-32293
- TRAPP, D. L.**
Cost realism: Assuring more realistic contractor cost proposals
[AD-P002800] p 75 N84-23346
- TRATTNIG, W.**
EDDA: A very high level data flow specification language
p 42 N84-14735
- TREACY, J. J.**
Effects of FAR 25.1309 on airplane operation and maintenance
[SAE PAPER 831405] p 98 A84-29626
- TRELLA, M.**
The ESA technological research programs
p 66 N84-34717
- TROXLER, G.**
Psychological and biochemical effects of a stress management program
[AD-P003300] p 7 N84-28447
- TSAL, J.**
Software quality measurement for distributed systems, volume 1
[AD-A137955] p 92 N84-21128
- TSAL, J.**
Software quality measurement for distributed systems. Volume 2: Guidebook for software quality measurement
[AD-A137956] p 92 N84-21129
- TSAL, J.**
Software quality measurement for distributed systems. Volume 3: Distributed computing systems. Impact on software quality
[AD-A137957] p 92 N84-21130
- TURNER, F.**
Advances in manufacturing technology
p 31 A84-28014

U

- ULLMAN, J. D.**
Universal relation database systems
[AD-A135707] p 46 N84-19176

V

- VALENT, B.**
AMIX: An automated system for handling error notification data
p 91 N84-14734

- VANDENBOSCH, F. J.**
Functional requirements for the development and use of a software-cost database
[AD-B079998] p 72 N84-22287
- VANDENDAM, R. F.**
The influence of Computer Aided Design (CAD) on research
[NLR-MP-83026-U] p 36 N84-31984
- VANDERVELDE, W. E.**
The dynamics of software development project management: An integrative systems dynamic perspective
[NASA-CR-175342] p 44 N84-16824
- VANFLEET, D. D.**
Factor stability and construct validation of Yukl's MBS (Managerial Behavior Survey) for military leadership
[AD-P003246] p 21 N84-28413
- VANHAMS, M. M.**
The contract p 60 A84-15304
- VARSHAVSKIY, A. Y.**
Prerequisites for scientific-technical progress enumerated p 50 N84-23395
- VERTREES, J.**
Engine product performance agreements and the future
[AD-P002821] p 94 N84-23366
- VICAS, A. G.**
The economics of space manufacturing - Some fundamental propositions
[AAS PAPER 83-243] p 68 A84-29882
- VICTOR, G. A.**
Computer simulation of construction operations p 28 N84-14704
- VIGNELLES, R.**
The management of large projects - Case study: Ariane p 60 A84-15324
- VIKTOROV, N. A.**
Social-psychological problems in the evaluation of engineering personnel in automated systems for the control of developing enterprises p 1 A84-23706
- VINSON, W. D.**
ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing. Volume 4, part 5, task D: Quality assurance/quality, control/technical requirement/tasks, quality assurance modeling and analysis, architecture for product assurance, (TTD)
[AD-A144691] p 37 N84-34999
- VOLKOV, I.**
Improvements in work of aircraft repair plant no. 402 p 88 N84-34425
- VONDRAN, R. F.**
Preferences on technical report format - Results of a survey p 39 A84-33153
The function of report components in the screening and reading of technical reports p 40 A84-45547
- VONDRAN, R. F., JR.**
Report format preferences of technical managers and nonmanagers p 40 A84-45572
- VONGLINOW, M. A.**
Organizational outcomes of creativity
[AD-A132825] p 3 N84-16066
- VONWINTERFELDT, D.**
Equal weights, flat maxima, and trivial decisions
[AD-A138506] p 18 N84-22342
- VOROBYEV, Y. I.**
Decision-making process in management automation p 25 N84-34644
- VORSTER, M. C.**
Information systems design in construction management p 27 N84-14696
- W**
- WAGDI, M. N.**
Configuration control methodology for system performance enhancement
[AIAA PAPER 84-1942] p 14 A84-43469
- WAGENAAR, W. A.**
Societal versus individual decision making: How they might differ
[IZF-1983-20] p 18 N84-22166
- WAGNER, R. E.**
Automated spacecraft health and status
[AIAA PAPER 84-0685] p 31 A84-25276
- WAGNER, S. S.**
Communication networks p 58 N84-33356
- WALES, H. M.**
DECISION TECHNOLOGY: The catalyst for acquisition improvement
[AD-P002755] p 18 N84-23302
- WALKER, R. B.**
The Program Planning Review (PPR): Milestone or milestone?
[AD-P003493] p 87 N84-32259
- WALKLET, D. C.**
Alternative strategies for space station financing
[NASA-CR-175412] p 72 N84-21437
- WALL, W. C., JR.**
Integrated management in matrix organization p 13 A84-23989
- WANSTALL, B.**
The 'affordable' fighter market p 68 A84-20599
- WANTLAND, R. H.**
Management information system for engineering
[DE84-001655] p 28 N84-14984
- WARE, W. H.**
Information systems, security and privacy
[RAND/P-6930] p 47 N84-21402
- WARREN, L.**
Planning the use of robots p 32 A84-42760
- WASSERMAN, A. I.**
Comparing software development methodologies for Ada (trade name): A study plan
[PB84-178029] p 53 N84-27491
- WATSON, G. W., JR.**
Knowledge base management for model management systems
[AD-A132211] p 15 N84-14062
- WATSON, R. W.**
Special or general purpose end-to-end transport mechanisms in distributed systems: One view
[DE84-008297] p 51 N84-25367
- WATTERS, E. R.**
Training acquisition personnel through a local college
[AD-P002766] p 6 N84-23313
- WEBER, M.**
Decision support for innovation management: Application to the lighting industry
[IIASA-RR-83-29] p 20 N84-25503
- WEISS, D. J.**
Computer-based measurement of intellectual capabilities
[AD-A144065] p 12 N84-34162
- WEISS, D. M.**
A methodology for collecting valid software engineering data
[AD-A131332] p 41 N84-11781
- WEISS, G.**
Stochastic bounds on distributions of optimal value functions with applications to PERT, network flow and reliability
[REPT-81] p 21 N84-27593
- WELCH, B. H., III**
AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition
[AD-A144045] p 87 N84-33366
- WENDT, H.**
Cost/schedule management for software development
[AD-P003591] p 56 N84-31196
Software configuration management in a project environment
[AD-P003592] p 57 N84-31197
- WERKING, R.**
Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150
- WETTACH, R. H.**
ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing. Volume 4, part 5, task D: Quality assurance/quality, control/technical requirement/tasks, quality assurance modeling and analysis, architecture for product assurance, (TTD)
[AD-A144691] p 37 N84-34999
- WHITE, C. C., III**
ARIADNE - A knowledge-based interactive system for planning and decision support p 14 A84-33463
- WHITTINGTON, G. A.**
Project manager's guide
[DE83-014454] p 62 N84-11977
- WICKENS, C. D.**
A multiple processing resource explanation of the subjective dimensions of operator workload
[AD-A141455] p 9 N84-29480
- WIEDERHOLD, D. A.**
Matrix management in DoD: An annotated bibliography
[AD-A143316] p 24 N84-33253
- WIENCLAW, R. A.**
Determining cost and training effectiveness tradeoffs for trainer design: Test of an experimental model
[AD-P003455] p 10 N84-32232
- WILLIAMS, R. F.**
Management of risk and uncertainty in systems acquisition: Proceedings of the 1983 Defense Risk and Uncertainty Workshop
[AD-A136230] p 16 N84-19124
Designing the equitable risk contract
[AD-P002756] p 81 N84-23303
- WILLIAMSON, S. A.**
Organizational structures, processes, and problems: A literature review and taxonomy
[AD-A140979] p 23 N84-28665
- WILSON, D.**
Airworthiness directives - Recovering the cost of compliance p 97 A84-25032
- WILSON, D. J.**
RIM as the data base management system for a material properties data base p 48 N84-22312
- WILSON, M. E.**
Does the Prompt Payment Act insure timely contract payment?
[AD-P002778] p 101 N84-23325
- WILSON, W. M.**
The NASA Software Management and Assurance Program
[AIAA PAPER 83-2336] p 37 A84-10015
- WINGERT, T. L.**
Qualification testing and electrical measurement experience: A manufacturer's view p 96 N84-32705
- WISKERCHEN, M.**
Action Information Management System (AIMS): A user's view p 47 N84-21405
- WITMER, B. G.**
Training feedback handbook
[AD-A132565] p 2 N84-14683
- WOMER, N. K.**
An automated airframe production cost model
[AD-P002787] p 74 N84-23334
- WOODRUFF, C. D.**
Needed help for the Federal Acquisition Regulation Council
[AD-P002769] p 101 N84-23316
- WORLEY, J. K.**
An analysis of relationships among size, technology and structure in a contextually limited setting p 21 N84-27597
- WORM, G. H.**
Risk analysis: Comparing different contract types
[AD-P002788] p 74 N84-23335
Interactive risk analysis and development of standardized factors
[AD-A140758] p 77 N84-27473
- WOZNY, M. J.**
Impact of IPAD on CAD/CAM database university research p 34 N84-22318
- WREKSOMINDOJO, E. S.**
An approach to the design of a management information system: Development procedure for the Indonesian defense logistics staff
[AD-A134974] p 80 N84-18108
- WUWONGSE, V.**
An interactive system for supporting multiobjective decision making p 13 N84-21643
- WYSKIDA, R. M.**
A study of temporary task teams p 2 A84-31212
- Y**
- YANASSE, H. H.**
Worst case performance of some heuristics for lot size problems
[INPE-3134-PRE/525] p 78 N84-34205
- YOTHER, L. W.**
A study of the extent of automation in small college libraries and relationships of attitudes of library directors toward it p 58 N84-33260
- YOUNG, B. R.**
Software configuration management p 43 N84-14742
- YOUNG, D. B.**
Planning for reliability growth
[AIAA PAPER 83-2776] p 88 A84-12356
- YOUNG, J. S.**
Automated Construction Management System (ACMS). Volume 1: User's guide
[AD-A143031] p 30 N84-31971
Automated Construction Management System (ACMS). Volume 2: Program documentation
[AD-A143032] p 30 N84-31972
- YOUNG, R. S.**
A strategy for improving overhead cost control
[AD-A134661] p 71 N84-18092
- YUKL, G. A.**
Factor stability and construct validation of Yukl's MBS (Managerial Behavior Survey) for military leadership
[AD-P003246] p 21 N84-28413

Z

ZABEL, W. V.

A survey of contractor productivity measurement practices
[AD-P002831] p 76 N84-23376

ZACHARY, W. B.

Managing creative individuals in high-technology research projects p 1 A84-23990

ZAFREN, D. H.

Policy and legal issues involved in the commercialization of space
[GPO-21-495] p 100 N84-11069

ZAMPARELLI, S. J.

Competitive procurements: The synergistic linkage among government, industry and academe
[AD-P002773] p 73 N84-23320

ZEEDEBERG, T. D.

Quality management in procurement p 91 N84-17601

ZERVUDACKI, P.

Methods and practices of planning - Physical planning, resources, financial simulation p 12 A84-15312

ZHENG, Y. P.

Incentive Stackelberg strategies for deterministic multi-stage decision processes p 13 A84-19141

ZIMMERMAN, W.

Evaluation of the HARDMAN comparability methodology for manpower, personnel and training
[NASA-CR-173733] p 9 N84-28485

ZORN, C. K.

Deregulation and commuter airline safety p 99 A84-36942

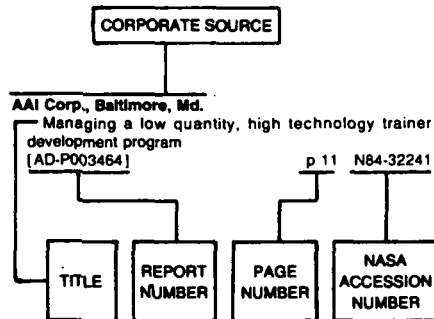
ZUCKER, S.

Automating the configuration management process p 38 A84-16633

ZWEBEN, W. H.

Analyzing program methodologies using software science
[AD-A138121] p 93 N84-22259

Typical Corporate Source Index Listing



Listings in this index are arranged alphabetically by corporate source. The title of the document is used to provide a brief description of the subject matter. The page number and the accession number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable, a report number is also included as an aid in identifying the document.

A

- AAI Corp., Baltimore, Md.**
Managing a low quantity, high technology trainer development program
[AD-P003464] p 11 N84-32241
- AAI Corp., Cockeysville, Md.**
Software progress tracking system
[AD-P003488] p 57 N84-32255
- Advanced Technology, Inc., Arlington, Va.**
Economic production rate study
[AD-P002793] p 74 N84-23340
Improving the effectiveness of award fee contracts for program management support services
[AD-P002827] p 75 N84-23372
- AECI Ltd., North Rand (South Africa).**
Productivity improvement in a jobbing shop
p 28 N84-18449
- Aeronautical Systems Div., Wright-Patterson AFB, Ohio.**
Assessing contracting workforce requirements in the matrixed organization
[AD-P002760] p 5 N84-23307
The avionics integrity program (AVIP)
[AD-P002817] p 93 N84-23362
A quality improvement strategy for systems acquisition
[AD-P002820] p 94 N84-23365
Engine product performance agreements and the future
[AD-P002821] p 94 N84-23366
The Score technique: An analytical approach for assessing the results of manufacturing reviews
[AD-P002838] p 30 N84-23383
MATE standardization
[AD-P003587] p 95 N84-31192
Managing aircraft/simulator concurrency
[AD-P003463] p 86 N84-32240
- Air Command and Staff Coll., Maxwell AFB, Ala.**
Determination of factors affecting performance and productivity in an engineering/design environment
[AD-A143315] p 11 N84-33252

- Matrix management in DoD: An annotated bibliography
[AD-A143316] p 24 N84-33253
Managing microcomputers: A survival kit for functional managers
[AD-A144006] p 59 N84-34316
- Air Force Academy, Colo.**
Evaluation of the BCT (Basic Cadet Training) paraprofessional counselor training at the United States Air Force Academy
[AD-P003244] p 7 N84-28411
Management information systems: A need for human factors
[AD-P003313] p 8 N84-28452
Leadership, managership, and computers in today's Air Force
[AD-P003351] p 22 N84-28468
- Air Force Armament Lab., Eglin AFB, Fla.**
Contracting initiative: Best proposal for price
[AD-P002782] p 73 N84-23329
Two-step industrial preparedness planning: Balancing funds and production capability
[AD-P002802] p 29 N84-23348
- Air Force Business Research Management Center, Wright-Patterson AFB, Ohio.**
DECISION TECHNOLOGY: The catalyst for acquisition improvement
[AD-P002755] p 18 N84-23302
Cost accounting standards: A time for government and industry action
[AD-P002767] p 72 N84-23314
Needed help for the Federal Acquisition Regulation Council
[AD-P002769] p 101 N84-23316
- Air Force Contract Management Div., Kirtland AFB, N. Mex.**
Material handling: A target for productivity improvement
[AD-P002829] p 83 N84-23374
- Air Force Hospital, Lackland AFB, Tex.**
Psychological and biochemical effects of a stress management program
[AD-P003300] p 7 N84-28447
- Air Force Human Resources Lab., Brooks AFB, Tex.**
Human factors products: A one-act play with epilogue
[AD-A133354] p 3 N84-16811
Individual differences in learning rate
[AD-P003338] p 8 N84-28462
Safety training priorities
[AD-A141711] p 95 N84-29026
Validation of relative-time-spent rating scales
[AD-A144067] p 12 N84-34169
- Air Force Human Resources Lab., Williams AFB, Ariz.**
Training capabilities: The facility part of the equation
[AD-P003457] p 11 N84-32234
- Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.**
Formal techniques in the management of software design
[AD-A132569] p 42 N84-13818
Life cycle costing in a dynamic environment
[AD-A133023] p 70 N84-14967
An exploratory study of the use of an inexpensive cordless telephone as a part of a data communications link
[AD-A134228] p 44 N84-16432
Microcomputer software system development: Suggested revisions to MIL-STD-1521A for cost-effective acquisition of custom software through software engineering
[AD-A134363] p 44 N84-16830
A method for designing computer support documentation
[AD-A134466] p 44 N84-16831
Information needs and system specifications for the B-1B executive information system
[AD-A134424] p 45 N84-17054
An approach to the design of a management information system: Development procedure for the Indonesian defense logistics staff
[AD-A134974] p 80 N84-18108
Multitype subcontractor selection criteria analysis
[AD-A135638] p 80 N84-19126

- Q-GERT model of the contracting cycle
[AD-A135639] p 16 N84-19127
Automated storage and retrieval systems—a consolidation of guidance for project management and implementation
[AD-A135571] p 80 N84-19175
Toward an interpersonal paradigm for superior-subordinate communication
[AD-A135863] p 17 N84-20166
Competitive procurements: The synergistic linkage among government, industry and academe
[AD-P002773] p 73 N84-23320
Nailing down the liability issue once and for all
[AD-P002777] p 101 N84-23324
Cost risk and contract type: A normative model
[AD-P002781] p 73 N84-23328
Large firm efficiency, concentration, and profitability in defense markets
[AD-P002810] p 75 N84-23356
Contractor fraud: Government response
[AD-P002833] p 101 N84-23378
Data envelopment analysis and extensions for decision support and management planning
[AD-A139430] p 19 N84-24489
Evaluation of automated configuration management tools in ADA programming support environments
[AD-A140982] p 53 N84-28666
Applications programs to facilitate use of a DBMS to store and retrieve graphics displays (INGRED 2)
[AD-A138059] p 54 N84-28672
An evaluation of two reliability and maintainability information systems
[AD-A143438] p 87 N84-33290
- Air Force Logistics Command, Wright-Patterson AFB, Ohio.**
Quality assurance - Air Force Logistics Command
[AD-P002816] p 93 N84-23361
- Air Force Space Div., Los Angeles, Calif.**
Office automation in the acquisition environment
[AD-P002747] p 49 N84-23294
The microcomputer in the acquisition environment
[AD-P002748] p 49 N84-23295
Closing the gap between R and D and application in academe to better support government and industry
[AD-P002761] p 63 N84-23308
Prerequisites for the establishment of a professional acquisition workforce
[AD-P002763] p 5 N84-23310
- Air Force Systems Command, Bolling AFB, Washington, D.C.**
Air Force Systems Command research planning guide (research objectives)
[AD-A138851] p 64 N84-23384
Guide to Canadian aerospace related industries
[AD-A140606] p 30 N84-26650
- Air Force Systems Command, Wright-Patterson AFB, Ohio.**
A program for developing automated scientific-information processing in maritime economy
[AD-A135518] p 45 N84-18107
Mechanized contract document preparation and abstract system
[AD-P002750] p 49 N84-23297
The acquisition management information system: Friend or foe?
[AD-P002751] p 50 N84-23298
Managing program risk: One way to reduce cost growth
[AD-P002754] p 72 N84-23301
Competition: An integral part of the acquisition process
[AD-P002774] p 73 N84-23321
- Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.**
Air force technical objective document FY 85
[AD-A141925] p 86 N84-31033
- Alexander Systems Co., San Diego, Calif.**
MITS II (Microfiche Image Transmission System) investigations and design alternatives
[AD-A141040] p 54 N84-28673

C

American Defense Preparedness Association, Arlington, Va.
 Proceedings of the 5th Interservice-Industry Training Equipment Conference, volume 2
 [AD-A142775] p 11 N84-32266

American Inst. for Research, Bedford, Mass.
 Computer Aided Source Selection (CASS)
 [AD-P002785] p 50 N84-23332

Amoco Production Co., Tulsa, Okla.
 RIM as an implementation tool for a distributed heterogeneous database p 48 N84-22311

Analytic Sciences Corp., Reading, Mass.
 US military aircraft cost handbook
 [AD-A136035] p 71 N84-18158

Analytics, Inc., Dayton, Ohio.
 Increasing spares competition in AFLC (Air Force Logistics Center)
 [AD-P002775] p 81 N84-23322
 Increasing competition for spares within AFLC (Air Force Logistics Command)
 [AD-A140751] p 85 N84-27588

ARCO Solar, Inc., Woodland Hills, Calif.
 Qualification testing and electrical measurement experience: A manufacturer's view p 96 N84-32705

Argonne National Lab., Ill.
 Project manager's guide
 [DE83-014454] p 62 N84-11977
 Tools for the creation of IMS database designs from Entity-Relationship diagrams p 42 N84-14066
 Guide to reporting time in the financial information system at ANL
 [DE84-009356] p 6 N84-25524

Arinc Research Corp., Annapolis, Md.
 Assessment of the NASA Flight Assurance Review Program
 [NASA-CR-173418] p 94 N84-23401

Arizona Univ., Tucson.
 Information search in judgment tasks: The effects of unequal cue validity and cost
 [AD-A141712] p 23 N84-29437

Army Armament Munitions and Chemical Command, Rock Island, Ill.
 Paperless solicitation and contracting
 [AD-P002749] p 49 N84-23296
 Training requirements for changing times
 [AD-P002764] p 5 N84-23311

Army Armament Research and Development Command, Dover, N. J.
 An analysis of the acquisition strategy decision process along three dimensions of the acquisition improvement program
 [AD-P002758] p 18 N84-23305

Army Construction Engineering Research Lab., Champaign, Ill.
 Automated Construction Management System (ACMS). Volume 1: User's guide
 [AD-A143031] p 30 N84-31971
 Automated Construction Management System (ACMS). Volume 2: Program documentation
 [AD-A143032] p 30 N84-31972

Army DARCOM Materiel Readiness Support Activity, Lexington, Ky.
 1982 US Army Materiel Development and Readiness Command (DARCOM) integrated logistic support (ILS) study finding on contracting for ILS
 [AD-P002805] p 82 N84-23351
 The new MIL-STDs (Military standard) 1388
 [AD-P002806] p 82 N84-23352
 Central Demand Data Base (CDDB) End Item Code (EIC)
 [AD-P002807] p 83 N84-23353

Army Industrial Base Engineering Activity, Rock Island, Ill.
 Manufacturing methods and technology, CAM (Computer Aided Manufacturing) related projects, FY 83-85
 [AD-A136572] p 33 N84-18924

Army Logistics Management Center, Fort Lee, Va.
 Designing the equitable risk contract
 [AD-P002756] p 81 N84-23303

Army Procurement Research Office, Fort Lee, Va.
 A survey of contractor productivity measurement practices
 [AD-P002831] p 76 N84-23376

Army Research Inst. for the Behavioral and Social Sciences, Alexandria, Va.
 Training feedback handbook
 [AD-A132565] p 2 N84-14683
 An overview of productivity improvement efforts in Army organizations
 [AD-A138589] p 19 N84-24490
 Research issues in training device design: The organization of a data base
 [AD-A140815] p 6 N84-26710

Research integration: An essential for Department of Defense psychological research
 [AD-P003366] p 65 N84-28479
 Video games: A human factors guide to visual display design and instructional system design
 [AD-P003368] p 9 N84-28480

Army Test and Evaluation Command, Aberdeen Proving Ground, Md.
 Integrated logistic supportability (Aviation materiel)
 [AD-A132367] p 79 N84-13146
 Human factors engineering. Part 2: HEDGE (Human factors engineering data guide for evaluation)
 [AD-A140391] p 6 N84-26303

Army Training Development Inst., Fort Monroe, Va.
 Evaluation results for the interactive video competency recognition system
 [AD-A133052] p 2 N84-15796

B

Baltimore Univ., Md.
 Behavioral issues in the management of technology
 [AD-P003349] p 9 N84-28467

Bedford Research Associates, Mass.
 Computer Generated Acquisition Document System (CGADS)
 [AD-P002784] p 50 N84-23331

Bell Telephone Labs., Inc., Greensboro, N. C.
 Study of the FAA (Federal Aviation Administration) program to modernize maintenance operations
 [AD-A142295] p 86 N84-29848

BioTechnology, Inc., Falls Church, Va.
 A review of major issues relating to human-machine integration in the development of military systems
 [AD-A136739] p 3 N84-20184
 An introduction to human factors for engineering managers: Framework for a teaching unit
 [AD-A135958] p 4 N84-20428

Boeing Aerospace Co., Seattle, Wash.
 Software quality measurement for distributed systems, volume 1
 [AD-A137955] p 92 N84-21128
 Software quality measurement for distributed systems. Volume 2: Guidebook for software quality measurement
 [AD-A137956] p 92 N84-21129
 Software quality measurement for distributed systems. Volume 3: Distributed computing systems. Impact on software quality
 [AD-A137957] p 92 N84-21130

Boeing Commercial Airplane Co., Seattle, Wash.
 Development of Integrated Programs for Aerospace-vehicle Design (IPAD). IPAD user requirements: Implementation (first-level IPAD)
 [NASA-CR-162713] p 30 N84-28776

Boeing Computer Services, Inc., Seattle, Wash.
 Computer-assisted engineering data base
 [ASME PAPER 83-WA/AERO-11] p 32 N84-30608
 Managing geometric information with a data base management system p 48 N84-22211

Boeing Military Airplane Development, Wichita, Kans.
 Concurrence of design criteria: A key to trainer readiness
 [AD-P003454] p 10 N84-32231
 Profit responsibilities in the simulation and training equipment industry
 [AD-P003497] p 77 N84-32263

Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
 A technical overview of the National Software Works
 [AD-A132320] p 42 N84-13827
 Applied cognitive science
 [AD-A136780] p 4 N84-20185

Booz-Allen and Hamilton, Inc., Arlington, Va.
 Space Station commercial user development
 [NASA-CR-173688] p 77 N84-27756

Booz-Allen and Hamilton, Inc., Bedford, Mass.
 LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 1
 [AD-A141396] p 54 N84-29786
 LONEX (Laboratory Office Network Experiment) cost/benefits study, volume 2
 [AD-A141397] p 54 N84-29787

Brett Schacht Associates, Johannesburg (South Africa).
 Tendering on a micro computer p 28 N84-14700

Brigham Young Univ., Provo, Utah.
 Manufacturing information system
 [AD-A137891] p 33 N84-20730

Brown (W. S.), Inc., Salt Lake City, Utah.
 Commercialization of opportunities for materials processing in low gravity
 [NASA-CR-170953] p 71 N84-15165

Burtek Corp., Tulsa, Okla.
 Logistic support: A computer manufacturer's viewpoint
 [AD-P003496] p 87 N84-32262

California Univ., Berkeley.
 Integrated bid estimate systems for contractors
 p 70 N84-14699
 Design and performance of a distributed relational data base system
 [AD-A142177] p 54 N84-29495

California Univ., Berkeley. Lawrence Berkeley Lab.
 Computer-assisted information graphics from the graphic design perspective
 [DE84-006059] p 48 N84-22281
 Proceedings of the 2nd International Workshop on Statistical Database Management
 [DE84-005866] p 52 N84-25522

California Univ., Livermore. Lawrence Livermore Lab.
 Revitalization: An organizational program for the individual
 [DE83-014949] p 2 N84-13013
 Introduction to flexible manufacturing systems: Their applications, classification, and opportunities
 [DE83-017373] p 33 N84-13868
 Special or general purpose end-to-end transport mechanisms in distributed systems: One view
 [DE84-008297] p 51 N84-25367

California Univ., Los Angeles.
 Issues in software maintenance
 [AD-A130622] p 40 N84-10786

California Univ., Santa Barbara.
 Research agenda in non-linear decision systems
 [PB84-161207] p 19 N84-24102
 Applying artificial intelligence to large networks
 p 36 N84-31743

Cape Town Univ. (South Africa).
 Information systems design in construction management p 27 N84-14696

Cardinal Management Associates, Inc., Washington, D.C.
 Appropriate Technology Small Grants Program evaluation, volume 1: Executive summary
 [DE84-010675] p 102 N84-31038
 Appropriate Technology Small Grants Program evaluation, volume 2
 [DE84-010674] p 102 N84-31039

Carnegie-Mellon Univ., Pittsburgh, Pa.
 Disjunctive programming and a hierarchy of relaxations for discrete optimization problems
 [AD-A132004] p 15 N84-12784
 The human side of robotics: Results from a prototype study on how workers react to a robot
 [AD-A133438] p 33 N84-15805
 Workshop on Magnetic Information Technology (MINT)
 [PB84-125210] p 45 N84-18619
 Knowledge-based support systems for long range planning
 [AD-A137311] p 17 N84-20424
 On the facial structure of scheduling polyhedra
 [AD-A136983] p 17 N84-20427
 The role of DBMS in design research
 p 34 N84-22317

Case Western Reserve Univ., Cleveland, Ohio.
 Optimization methods in hierarchical holographic modeling
 p 20 N84-26001

Catholic Univ. of America, Washington, D.C.
 Preferences on technical report format - Results of a survey
 p 39 N84-33153
 The function of report components in the screening and reading of technical reports
 p 40 N84-45547
 Report format preferences of technical managers and nonmanagers
 p 40 N84-45572

Civil Aeronautics Board, Washington, D.C.
 Deregulating the airlines: An economic analysis
 [PB83-250019] p 100 N84-14070
 Voluntary accounting systems for a small air carrier: Revenues, financial and traffic statistics
 [PB84-210996] p 78 N84-32369

Claremont Graduate School, Calif.
 Motivation and work performance: A comparative and analytical study
 p 6 N84-27441

Clemson Univ., S.C.
 An automated airframe production cost model
 [AD-P002787] p 74 N84-23334
 Unified database development program
 [AD-A140309] p 52 N84-26471

Cockerham (John M.) and Associates, Inc., Hopewell, Va.
 Cost risk trade-offs in timing the production decision
 [AD-P002753] p 29 N84-23300

College of William and Mary, Williamsburg, Va.
 A multi-item maintenance center inventory model for low-demand repairable items
 p 79 N84-45666

Colorado Univ., Colorado Springs.
 Situational interaction: A peer counseling approach to AWOL (unauthorized absences from duty) reduction
 [AD-P003243] p 7 N84-28410

Colorado Univ., Denver.

Affective determinants of job perceptions
[AD-P003258] p 7 N84-28425

Committee on Armed Services (U. S. House).

Technology transfer
[H-REPT-98-15] p 65 N84-25528

Committee on Commerce, Science, and Transportation (U. S. Senate).

Policy and legal issues involved in the commercialization of space
[GPO-21-495] p 100 N84-11069

Role of technology in promoting industrial competitiveness
[S-REPT-98-565] p 29 N84-19605

National Aeronautics and Space Administration Authorization Act, 1985
[H-REPT-98-629] p 101 N84-21443

Transfer of civil meteorological satellites
[S-REPT-98-260] p 102 N84-24503

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[S-REPT-98-455] p 102 N84-24506

Committee on Science and Technology (U. S. House).

Space commercialization
[GPO-22-870] p 70 N84-10108

Biological clocks and shift work scheduling
[GPO-21-747] p 2 N84-12713

Space commercialization
[GPO-26-498] p 71 N84-17194

Joint industry/university cooperation with federally supported research facilities
[GPO-24-902] p 100 N84-18115

National Aeronautics and Space Administration Authorization Act, 1985
[H-REPT-98-629] p 101 N84-21444

Biological clocks and shift work scheduling
[GPO-29-312] p 6 N84-25277

The 1985 NASA authorization
[GPO-31-453] p 102 N84-25526

Future of aeronautics
[GPO-29-744] p 30 N84-25529

The role of information technology in emergency management
[GPO-29-457] p 103 N84-34319

Commercial Space Launch Act
[H-REPT-98-816] p 103 N84-34329

Review of the National Aeronautics and Space Act of 1958, as amended
[GPO-38-705] p 103 N84-35134

Committee on Small Business (U. S. House).

Paperwork Reduction Act of 1980
[S-REPT-98-479] p 102 N84-24504

Impact of robots and computers on the work force of the 1980's
[GPO-31-912] p 36 N84-32826

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[GPO-31-453] p 27 N84-14698

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Further delineation of the utilization of scientific literature by U.S. patents
[PB84-100734] p 100 N84-18095

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Recommended test and evaluation and independent verification and validation actions for the Defense Data Network
[AD-A134167] p 44 N84-17049

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Improving the air traffic control system: An assessment of the National Airspace System Plan
[GPO-29-457] p 80 N84-16160

Connecticut Univ., Storrs.

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[H-REPT-98-816] p 58 N84-33260

Corpus Christi Army Depot, Tex.

Project: Acquisition strategy
[AD-P002809] p 83 N84-23355

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Quality management in procurement
[GPO-29-457] p 91 N84-17601

Design QA on a small batch project
[GPO-29-457] p 92 N84-17603

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[PB84-118314] p 45 N84-18945

D**Dayton Univ., Ohio.**

A dynamic personnel assignment model in the R and D environment
[AD-P002765] p 5 N84-23312

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The application of management techniques to defence and other information services: The British approach
[AD-P002778] p 48 N84-21433

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Does the Prompt Payment Act insure timely contract payment?
[AD-P002778] p 101 N84-23325

Defense Contract Administration Services, Cleveland, Ohio.

Quality at the crossroads
[AD-P002818] p 93 N84-23363

Defense Fuel Supply Center, Alexandria, Va.

Tactical buying decisions for strategic petroleum reserve spot procurements: The tunnel theory
[AD-P002812] p 75 N84-23358

Defense Logistics Agency, Alexandria, Va.

Consolidation of DOD bidder's mailing list application
[AD-P002752] p 81 N84-23299

Incentives for product quality need contract, cost, production and field co-operation
[AD-P002819] p 93 N84-23364

Employment changes resulting from the award of contracts in labor surplus areas
[AD-P002834] p 83 N84-23379

Defense Systems Management School, Fort Belvoir, Va.

Management of risk and uncertainty in systems acquisition: Proceedings of the 1983 Defense Risk and Uncertainty Workshop
[AD-A136230] p 16 N84-19124

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[AD-P002789] p 64 N84-23336

Defense systems acquisition review process: A history and evaluation
[AD-P002822] p 64 N84-23367

Program Manager's Support System (PMSS): An update
[AD-P002825] p 50 N84-23370

Defense Technical Information Center, Alexandria, Va.

Strengthening small business participation in Department of Defense extramural research and development
[AD-P002832] p 64 N84-23377

Format requirements for scientific and technical reports prepared by or for the Department of Defense
[AD-A141758] p 54 N84-29799

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Prototype development of an information-sharing and decision support system for the manpower personnel and training community
[AD-P003310] p 8 N84-28451

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On 'Before' and 'After' cost comparisons
[AD-P002799] p 75 N84-23345

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Bottom Line Academia Conference
[AD-A131043] p 90 N84-11048

Department of Energy, Oak Ridge, Tenn.

Management of aerospace contract documentation by industry and government
[DE84-900451] p 47 N84-21396

Management of aerospace contract documentation by industry and government
[DE84-900451] p 48 N84-21434

Department of Energy, Washington, D. C.

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[DE84-012578] p 78 N84-32269

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[AD-P003591] p 56 N84-31196

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[AD-P003592] p 57 N84-31197

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[GPO-29-457] p 45 N84-17069

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Research on factor screening in computer simulation
[AD-A139825] p 20 N84-25353

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Policy initiatives to achieve readiness and support objectives
[AD-P002804] p 82 N84-23350

Du Pont de Nemours (E. I.) and Co., Alken, S.C.

Use of microcomputers for inventory management with uncertain demand
[DE84-005179] p 81 N84-21112

E**Eagle Technology, Inc., Arlington, Va.**

Reliability programs for nonelectronic designs, volume 2
[AD-A133625] p 91 N84-14528

Reliability programs for nonelectronic designs, volume 1
[AD-A133624] p 91 N84-14529

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AN/TPN-19 improvements program management plan
[AD-A140728] p 84 N84-26690

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National Airspace Review: Implementation plan
[AD-A145379] p 86 N84-31107

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Integrated Software Engineering Facilities (ISEF)
[ESA-SP-1048] p 42 N84-14730

The Integrated Software Engineering Facilities (ISEF) software configuration management system
[ESA-SP-1048] p 42 N84-14732

ANSI Ada and the UK M-CHAPSE
[ESA-SP-1048] p 91 N84-14760

The Apollo concept: Electronic document delivery by satellite
[ESA-SP-1048] p 46 N84-19179

ESA and its programs: Present and future
[ESA-SP-1048] p 66 N84-34716

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[ESA-SP-1048] p 77 N84-28678

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[ESA-PSS-01-10-ISSUE-1] p 95 N84-26035

The ESA technological research programs
[ESA-PSS-01-10-ISSUE-1] p 66 N84-34717

F**Federal Aviation Administration, Washington, D.C.**

Information resources management plan
[AD-A131964] p 41 N84-13023

Introduction to the airport improvement program
[AD-A144556] p 103 N84-34454

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[AD-P003574] p 56 N84-31179

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[PB84-195155] p 87 N84-33067

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[GPO-29-457] p 43 N84-14753

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Measuring quality achievements
[GPO-29-457] p 92 N84-17605

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Progress in improving program and budget information for Congressional use
[AD-A137491] p 72 N84-22511

National Aeronautics and Space Administration's first-year implementation of the Federal Managers' Financial Integrity Act
[PB84-188770] p 103 N84-31044

Department of Energy's activities to limit distribution of certain unclassified scientific and technical information
[PB84-189158] p 57 N84-32302

General Electric Co., Daytona Beach, Fla.

The Program Planning Review (PPR): Milestone or milestone?
[AD-P003493] p 87 N84-32259

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[DE84-008021] p 55 N84-29802

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The software engineering environment project model (PROMOD)
[GPO-29-457] p 42 N84-14737

H

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[DE83-012166] p 90 N84-12510
- HKC Systems (Pty) Ltd. (South Africa).**
Site computers p 28 N84-14701
- Honeywell, Inc., West Covina, Calif.**
Determining cost and training effectiveness tradeoffs for trainer design: Test of an experimental model
[AD-P003455] p 10 N84-32232
- Human Engineering Labs., Aberdeen Proving Ground, Md.**
Human engineering guidelines for management information systems. Change 1
[AD-A137808] p 4 N84-21104

I

- IBM Federal Systems Div., Bethesda, Md.**
Defense industry attitudes about AF interface standards report of an electronics industries association survey
[AD-P003570] p 95 N84-31175
- IBM Federal Systems Div., Houston, Texas.**
Projecting manpower to attain quality p 5 N84-23148

- IBM S.A. Proprietary Ltd., Johannesburg (South Africa).**
Keeping your fingers crossed won't help p 28 N84-14702

- Illinois Inst. of Tech., Chicago.**
Applications of operations research and management information system concepts to management of large software projects p 47 N84-21204

- Illinois Univ., Champaign.**
Psychophysiological tools in engineering psychology
[AD-P003337] p 8 N84-28461

- Illinois Univ., Urbana.**
Artificial intelligence implications for information retrieval
[AD-A131382] p 32 N84-11821
- A multiple processing resource explanation of the subjective dimensions of operator workload
[AD-A141455] p 9 N84-29480

- Illinois Univ., Urbana-Champaign.**
Models of purposive human organization: A comparative study
[AD-A138871] p 19 N84-24491
- The relationship between administrative style and the use of computer-based systems: An attitudinal study of academic library professionals p 11 N84-32276

- Indiana Univ., Bloomington.**
The effects of task variability, sensory reinforcement, and monetary reinforcement on performance, satisfaction, and intrinsic motivation p 7 N84-27584

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Mobilization and defense management technical reports series. Management implications of industrial support capabilities for Space Shuttle operations
[AD-A137460] p 81 N84-19390

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[AD-A131596] p 15 N84-13010

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Artificial intelligence applications to maintenance technology working group report IDA/OSD R and M (Institute for Defense Analyses/Office of the Secretary of Defense Reliability and Maintainability) study
[AD-A137329] p 33 N84-19827

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[AD-A137761] p 33 N84-20867

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Societal versus individual decision making: How they might differ
[IZF-1983-20] p 18 N84-22166

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SIRIUS: Bibliographic search and retrieval system
[INPE-2771-PRE/344] p 52 N84-25512
- Worst case performance of some heuristics for lot size problems
[INPE-3134-PRE/525] p 78 N84-34205
- Difficulties of scientific and technological planning
[INPE-2786-PRE/352] p 24 N84-34308

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A system for embedding data displays in graphical contexts
[AD-A143630] p 24 N84-34191

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[AD-A134092] p 43 N84-14766

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- Decision support for innovation management: Application to the lighting industry
[IIASA-RR-83-29] p 20 N84-25503

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Competitive assessment of the U.S. Civil aircraft industry
[PB84-154913] p 76 N84-25525

- Iowa State Univ. of Science and Technology, Ames.**
The government relationship to industry in technology transfer and development
[AD-P002772] p 29 N84-23319

J

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- Building an information model (with the help of PSL/PSA)
[AIAA PAPER 83-2329] p 37 N84-10011
- Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text p 39 N84-44325
- Ada and the NASA software environment p 43 N84-14749

- Evaluation of the HARDMAN comparability methodology for manpower, personnel and training
[NASA-CR-173733] p 9 N84-28485

Joint Publications Research Service, Arlington, Va.

- Trade agreements on know-how discussed p 70 N84-10349
- Measures to step up practical use of scientific work discussed p 26 N84-10350
- Effects of science, technology on structure of production process p 26 N84-10351
- Use of scientific potential in industry discusses p 26 N84-10353

- Scientists discuss increased production with fewer workers p 26 N84-10356

- Scientist discusses problems in introducing new technology p 62 N84-10357

- The socialist and developing countries: Technology transfer p 62 N84-11035

- Organizational improvements in CEMA scientific, technical cooperation sought p 62 N84-11039

- Lack of support for introduction of Soviet inventions scored p 62 N84-11042

- Sixth all-union congress of inventors held p 62 N84-11043

- Applications of academic research neglected by industry p 62 N84-11044

- Report on development, installation of industrial robots p 32 N84-11339

- Concerted effort for nationwide computer literacy p 4 N84-22357

- Incentives for new production discussed p 102 N84-23388

- Use of economic mechanisms in managing scientific and technical progress p 76 N84-23389

- Computer developments at Institute of Automation and Electrometry described p 34 N84-23390

- Technical and economic indicators for industrial technological institutes p 76 N84-23392

- Research in man-machine interaction discussed p 6 N84-23393

- Prerequisites for scientific-technical progress enumerated p 50 N84-23395

- Problems of prompt adoption of new technology discussed p 50 N84-23396

- Saab claims world's most modern engine-assembly plant p 34 N84-23800

- USSR report: Machine tools and metalworking equipment [JPRS-UMM-84-008] p 34 N84-23913

- Industry urged to increase output of NC machine tool, robotics p 35 N84-23914

- Industry official on progress in Soviet robotics program p 35 N84-23915

- Use of robots in Estonian auto, machine tool industries viewed p 35 N84-23916

- Robotics impact on labor productivity examined p 35 N84-24104

- Impact of Latvian Robotics Institute on industry modernization p 35 N84-24110

- Realization of human work capacity: Interdisciplinary problems p 10 N84-31920

- Improvements in work of aircraft repair plant no. 402 p 88 N84-34425

- Decision-making process in management automation p 25 N84-34644

- Commentary on Philips R and D strategy, policies, major efforts p 66 N84-34647

- Mid-robots get underway in September: Lab-industry link p 36 N84-34649

- Academician Varnos interviewed on automation related problems p 36 N84-34972

K

- Kansas Univ., Lawrence.**
Equal weights, flat maxima, and trivial decisions
[AD-A138506] p 18 N84-22342

L

LABEN Space Instrumentation and Systems, Milan (Italy).

- The role of quality assurance in the development of software for space applications p 91 N84-14743

Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).

- Techniques of condition monitoring and fault diagnosis in industry p 27 N84-13595

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- A field study of Air Force organization structures
[AD-A142389] p 23 N84-31035

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[GPO-21-495] p 100 N84-11069

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[AD-A136020] p 16 N84-19129

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- The aircraft availability model: Conceptual framework and mathematics
[AD-A132927] p 79 N84-14115

- A strategy for improving overhead cost control
[AD-A134661] p 71 N84-18092

- Analysis of incentives for productivity-enhancing investment
[AD-P002770] p 73 N84-23317

- Improved management of support resources
[AD-P002808] p 83 N84-23354

- A concept for mission-oriented planning for system acquisition at the Defense Communications Agency
[AD-P002823] p 19 N84-23368

- System safety in aircraft acquisition
[AD-A141492] p 95 N84-28763

- Local automation model: System specification
[AD-A141503] p 54 N84-29798

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- Future directions in large-scale scientific computing
[DE83-013229] p 40 N84-10807

- Modeling the user in intelligent user interfaces
[DE84-012664] p 2 N84-14795

- Benchmarking unstructured systems
[DE83-011175] p 15 N84-14969

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- [AD-A144691] p 37 N84-34999

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[AD-A136035] p 71 N84-18158

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[AD-P002792] p 74 N84-23339

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- Software configuration management p 43 N84-14742

Martin Marietta Aerospace, Denver, Colo.

- RIM as the data base management system for a material properties data base p 48 N84-22312

Martin Marietta Aerospace, Orlando, Fla.

- Standards and integrated avionic digital system architecture
[AD-P003561] p 95 N84-31166

Maryland Univ., College Park.

- Method for accessing distributed heterogeneous databases p 47 N84-21412

- Monitoring software development through dynamic variables p 49 N84-23139

Strategies and mechanisms for the diffusion of scientific and technical information: A comparative study
p 51 N84-23406

Massachusetts Inst. of Tech., Cambridge.

The dynamics of software development project management: An integrative systems dynamic perspective
[NASA-CR-175342] p 44 N84-16824
Interaction of human cognitive models and computer-based models in supervisory control
[AD-A142677] p 23 N84-30717
Communication networks p 58 N84-33356

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Research in adaptive control hybrid and constrained structure systems
[AD-A140496] p 20 N84-26345

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The Optical Coincidence Information Retrieval system (OCIR)
[MPAE-L-66-84-10] p 56 N84-31059

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Organizational structures, processes, and problems: A literature review and taxonomy
[AD-A140979] p 23 N84-28665

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Requirements analysis for forward funding tracking system, volume 1
[AD-A136840] p 46 N84-20425
Requirements analysis for milestone tracking system, volume 2
[AD-A136841] p 46 N84-20426

Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany).

Profitability improvement of projects by early consideration of life cycle cost reduction
[MBB-UR-620-83-Q] p 76 N84-24495
Important CAD/CAM utilization at MBB
[MBB-Z-13-83-Q] p 35 N84-26451

Project management in the 80's
[MBB-UR-631-83-Q] p 65 N84-26454

Michigan Univ., Ann Arbor.

A model of inter-organizational influences on organizational processes
[AD-A142450] p 23 N84-31037

Military Academy, West Point, N. Y.

Impact of IPAD on CAD/CAM database university research p 34 N84-22318
The role of relevant experience and intellectual ability in determining the performance of military leaders: A contingency model explanation
[AD-P003303] p 22 N84-28448

Minnesota Univ., Minneapolis.

Computer-based measurement of intellectual capabilities
[AD-A144065] p 12 N84-34162

Missouri Univ., Columbia.

An investigation of organizational climate: Definition, measurement, and usefulness as a diagnostic technique
p 21 N84-27595

Missouri Univ., Rolla.

The database management system: A topic and a tool
p 48 N84-22316

Mitre Corp., Bedford, Mass.

HQ AFSC selection of a microprocessor development system
[AD-A134930] p 45 N84-17891
Software Acquisition Resource Expenditure (SARE) data collection methodology
[AD-A137084] p 71 N84-20247
Software Cost Estimation Workshop report
[AD-A139840] p 51 N84-25354
Environments for evaluating performance of C3I (Command, Control, Communications, and Intelligence) systems
[AD-P003237] p 21 N84-28404

Mitre Corp., McLean, Va.

Guidelines for developing NASA (National Aeronautics and Space Administration) ADP security risk management plans
[NASA-CR-173564] p 52 N84-26317
Guidelines for development of NASA (National Aeronautics and Space Administration) computer security training programs
[NASA-CR-173562] p 52 N84-26318
Guidelines for contingency planning NASA (National Aeronautics and Space Administration) ADP security risk reduction decision studies
[PB84-189836] p 55 N84-30737

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Exploring the interaction of the Vroom/Yetton model and leadership style (LPC) (Least Preferred Coworker) as it predicts performance
[AD-P003247] p 22 N84-28414

Subordinate perceptions of contingent leaders: Do followers accept our theories?
[AD-P003248] p 22 N84-28415

N

National Academy of Engineering, Washington, D. C.

Strengthening the government-university partnership in science
[PB83-230870] p 100 N84-11979

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Priorities for detailed quality assessments of the National Defense Stockpile nonfuel materials
[NMAB-403] p 93 N84-23011
Workshop on Systems Analysis
[PB84-194661] p 24 N84-33138

National Aeronautics and Space Administration, Washington, D. C.

The NASA Software Management and Assurance Program
[AIAA PAPER 83-2336] p 37 A84-10015
NASA patent abstracts bibliography. Section 1: Abstracts. A continuing bibliography
[NASA-SP-7039(23)-SECT-1] p 100 N84-13017
NASA Patent Abstracts Bibliography. Section 2: Indexes. A continuing bibliography (supplement 23)
[NASA-SP-7039(23)-SECT-2] p 100 N84-13018
NASA patent abstracts bibliography. Section 1: Abstracts
[NASA-SP-7039(24)-SECT-1] p 101 N84-20432
Patent abstracts bibliography, a continuing bibliography. Section 2: Indexes
[NASA-SP-7039(24)-SECT-2] p 101 N84-20433
NASA's emerging productivity program
p 92 N84-21404

Action Information Management System (AIMS): A user's view
p 47 N84-21405
Automated RTOP management system
p 47 N84-21406

Management. A continuing bibliography for NASA managers, with indexes
[NASA-SP-7500(18)] p 20 N84-26429

NASA Administrative Data Base Management Systems, 1984
[NASA-CP-2323] p 58 N84-33266

Effective organizational solutions for implementation of DBMS software packages
Spinoff, 1984
[NASA-TM-85596] p 65 N84-33305

Master list and index to NASA directives
[NASA-TM-87362] p 59 N84-34321

National Aeronautics and Space Administration, Ames Research Center, Moffett Field, Calif.

Project management techniques for highly integrated programs
[NASA-TM-86023] p 63 N84-14965
Software control and system configuration management: A systems-wide approach
[NASA-TM-85908] p 56 N84-31112

National Aeronautics and Space Administration, Hugh L. Dryden Flight Research Center, Edwards, Calif.

Software control and system configuration management: A systems-wide approach
[NASA-TM-85908] p 56 N84-31112

National Aeronautics and Space Administration, Flight Research Center, Edwards, Calif.

Software control and system configuration management - A process that works
p 38 A84-26713

National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

Automated administrative data bases
p 47 N84-21411

NASA-wide standard administrative systems
p 48 N84-21415

Managers handbook for software development
[NASA-TM-85604] p 49 N84-23150

Administrative automation in a scientific environment
p 58 N84-33269

A user view of office automation or the integrated workstation
p 58 N84-33271

National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Tex.

Forecasting trends in NASA flight software development tools
[AIAA PAPER 83-2334] p 38 A84-10065

National Aeronautics and Space Administration, John F. Kennedy Space Center, Cocoa Beach, Fla.

The administrative window into the integrated DBMS
p 58 N84-33270

National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

Preferences on technical report format - Results of a survey
p 39 A84-33153

Naval Postgraduate School, Monterey, Calif.

The function of report components in the screening and reading of technical reports
p 40 A84-45547

Report format preferences of technical managers and nonmanagers
p 40 A84-45572

National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.

Government - contractor interaction
[AD-P002768] p 63 N84-23315

National Aerospace Lab., Amsterdam (Netherlands).

Security, a set of rules or an approach
[NLR-MP-82047-U] p 47 N84-20442

Functional requirements for the development and use of a software-cost database
[AD-B079998] p 72 N84-22287

A data management and presentation tool for engineering and research
[NLR-MP-83044-U] p 53 N84-27482

The influence of Computer Aided Design (CAD) on research
[NLR-MP-83026-U] p 36 N84-31984

National Bureau of Standards, Washington, D.C.

Computer science and technology: Microcomputer: A review of federal agency experiences
[PB83-238972] p 41 N84-11772

Guidance on software maintenance
[PB84-128951] p 45 N84-18952

Specifications for a federal information processing standard data dictionary system
p 93 N84-21414

Computer science and technology: Selection of microcomputer systems
[PB84-167725] p 51 N84-25331

Comparing software development methodologies for Ada (trade name): A study plan
[PB84-178029] p 53 N84-27491

Computer science and technology: Introduction to software packages
[NBS-SP-500-114] p 55 N84-30740

I/O channel interface
[NBS-FIPS-PUB-60-2] p 57 N84-33057

National Center for Appropriate Technology, Butte, Mont.

Appropriate technology management information system
[DE84-010952] p 56 N84-31056

National Productivity Inst., Pretoria (South Africa).

Productivity and the forging industry
p 28 N84-18448

National Research Inst. for Mathematical Sciences, Pretoria (South Africa).

Interactive decision analysis and modelling
[CSIR-TWISK-294] p 20 N84-25403

National Science Foundation, Washington, D.C.

Papers for and a summary of a Workshop on The Role of Basic Research in Science and Technology: Case Studies in Energy R and D (Research and Development)
[PB83-213637] p 62 N84-11052

Report of the Information Technology Workshop
[AD-A144212] p 37 N84-35126

Naval Air Systems Command, Washington, D. C.

Multi-year procurement a 'Team approach'
[AD-P002780] p 82 N84-23327

Naval Electronic Systems Command, Washington, D. C.

Mortality and spareparts: A conceptual analysis
[AD-P002826] p 83 N84-23371

Naval Ocean Systems Center, San Diego, Calif.

NOSC (Naval Ocean Systems Center)-Hawaii perceptual sciences research program
[AD-P003361] p 9 N84-28474

Naval Personnel Research and Development Center, San Diego, Calif.

Productivity improvement in a purchase division: Evaluation of a Performance Contingent Reward System (PCRS)
[AD-A133589] p 71 N84-16801

Naval Postgraduate School, Monterey, Calif.

Computer system design environment software development plan
[AD-A131651] p 41 N84-12747

Artificial intelligence techniques for industrial applications in job shop scheduling
[AD-A132164] p 32 N84-13867

Knowledge base management for model management systems
[AD-A132211] p 15 N84-14062

General Purpose Electronic Test Equipment (GPETE) acquisition considerations for automated calibration
[AD-A133865] p 91 N84-14709

Technical and economic analysis of the planned visual display terminal employment for the Stock Point Logistics Integrated Communications Environment (SPLICE)
[AD-A133642] p 80 N84-14711

A calculator adaptation of the Markov chain model for manpower analysis
[AD-A132990] p 15 N84-14966

The determination of user information requirements during the development of management information systems
[AD-A132998] p 43 N84-14980
A multi-period repair parts inventory model for a naval air rework facility
[AD-A136873] p 81 N84-19280
Benchmarking the selection and projection operations and ordering capabilities of relational database machines
[AD-A136776] p 46 N84-20438
Statistical models for estimating overhead costs
[AD-A137351] p 71 N84-20444
Decision theory: Individual biases and their effect on forecasting in an organization
[AD-A137943] p 17 N84-21395
Methodology for benefit analysis of CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) in USN shipyards
[AD-A138398] p 34 N84-22270
Contractor 'Hungriness' and the relative profitability of DoD business
[AD-P002796] p 74 N84-23342
A guide to macro and micro computer performance evaluation
[AD-A140127] p 51 N84-25329
A knowledge-based system for LP (Linear Programming) modeling
[AD-A139991] p 35 N84-25357
Naval aviation IMA repair capability: A readiness to resources approach
[AD-A140465] p 84 N84-25612
An analysis of naval aviation configuration status accounting
[AD-A140473] p 84 N84-26460
PROJUNG FORTRAN: An interactive computer program for use with the defense management simulation exercise
[AD-A140709] p 53 N84-27472
The decision for the optimal price in competitive bidding: The case of a Korean construction company
[AD-A140556] p 65 N84-27585
Contract audit followup: Its impact on defense contracting
[AD-A140627] p 85 N84-27587
The introduction of uncertainty techniques to the productivity investment fund
[AD-A140864] p 20 N84-27591
Control systems
[AD-A140901] p 21 N84-27592
Office automation: A look beyond word processing
[AD-A132764] p 53 N84-28670
The database management module of the SPLICE system
[AD-A132795] p 85 N84-28671
Analysis of modern analog and digital communication channels from a manager's perspective
[AD-A143161] p 57 N84-31494
An analysis of the effectiveness of the problem solving skills for managers training package-USCG
[AD-A144017] p 12 N84-34317
The simulation of a major Automated Information System (AIS) on a microcomputer
[AD-A143599] p 59 N84-34323
The creation of a central database on a microcomputer network
[AD-A143875] p 59 N84-34326
Comparative analysis of government and private sector ADP acquisition
[AD-A144523] p 59 N84-35131
Naval Research Lab., Washington, D. C.
A methodology for collecting valid software engineering data
[AD-A131332] p 41 N84-11781
Accuracy of software development activity data: The software cost reduction project
[AD-A137639] p 71 N84-21122
Naval Sea Systems Command, Washington, D.C.
Selection of multiple sources in weapon systems acquisition
[AD-P002837] p 84 N84-23382
Improving system affordability
[AD-A142387] p 77 N84-31062
Naval Ship Research and Development Center, Bethesda, Md.
Computer generation of plan of action and milestone schedule
[AD-A137057] p 46 N84-20244
Naval War Coll., Newport, R. I.
AVCAL (Aviation Consolidated Allowance) restoration program and aircraft material condition
[AD-A144045] p 87 N84-33366
Navy Personnel Research and Development Center, San Diego, Calif.
Methods for improving the user-computer interface
[AD-A132657] p 2 N84-14713

Guide to the development of a human factors engineering data retrieval system
[AD-A136918] p 4 N84-20187
New England Apparel Manufacturers' Association, Inc., Fall River, Mass.
Manual for implementing a Shared Time Engineering Program (STEP) September 1980 through September 1983
[PB84-144260] p 29 N84-21765
New South Wales Univ., Sydney (Australia).
The impact of a computerized network on the quality of work life in two college of advanced education libraries in New South Wales
p 9 N84-29792
North American Air Defense Command, Peterson AFB, Colo.
Reliability in space: Program manager and user awareness
[AD-P002148] p 94 N84-23813
North Carolina Univ., Chapel Hill.
Estimating critical path and arc probabilities in stochastic activity networks
[AD-A134255] p 16 N84-16925
North Carolina Univ., Charlotte.
Research on shock models, wear processes, replacement and maintenance policies
[AD-A135620] p 80 N84-19028
Northeastern Univ., Boston, Mass.
Factors explaining decisions to terminate or continue an R and D project, executive summary
[PB83-256602] p 63 N84-14971
Factors explaining decisions to terminate or continue an R and D project
[PB83-256594] p 63 N84-14972
Norton AFB Ballistic Missile Office, Calif.
The structure of processing resource demands in monitoring automatic systems
[AD-P003319] p 8 N84-28455
Notre Dame Univ., Ind.
The make or buy decision—its nature and impact
[AD-P002779] p 82 N84-23326
Increasing the Contractor/Subcontractor/Vendor bidding lists
[AD-P002836] p 84 N84-23381
Incentive contracts and cost growth
[AD-A140930] p 85 N84-28663
Evaluating the availability, role, and performance of subcontractors in the aerospace industry
[AD-A141408] p 85 N84-29788

O

Oak Ridge Gaseous Diffusion Plant, Tenn.
Management information system for engineering
[DE84-001655] p 28 N84-14984
Oak Ridge National Lab., Tenn.
Proceedings of the 1982 Integrated Data Users Workshop
[DE83-014761] p 40 N84-11066
Two-level compromise designs for estimating main effects and detecting interactions
[DE84-002997] p 16 N84-18094
ORNL trends and balances, 1984-1989
[DE84-006320] p 63 N84-21397
An evaluation of the system 2000 data base management system for use in major item system mapping
[DE84-013130] p 87 N84-32296
Oak Ridge Y-12 Plant, Tenn.
INTERACT execute facility for job scheduling and manipulation
[DE84-001653] p 43 N84-14968
Oakland Univ., Rochester, Mich.
Relevant and irrelevant legal structures: Distinguishing private sector from DOD contracting
[AD-P003241] p 102 N84-28408
Office of Naval Research, London (England).
A survey of European robotics research
[AD-A138952] p 34 N84-23122
Science in the European Economic Community: A self-assessment and a detailed plan of action
[AD-A139078] p 102 N84-24492
Office of the Comptroller of the Army, Washington, D. C.
Now: An initial approach to collection of major materiel systems actual costs
[AD-A139845] p 76 N84-25505
Office of the Under Secretary of Defense for Research and Engineering, Washington, D. C.
Report of the DOD-University forum working group on engineering and science education
[AD-A138205] p 5 N84-23292
The industrial modernization incentives program: An experimental effort to improve defense contractor productivity
[AD-P002771] p 29 N84-23318

Contract requirements: A key to controlling DoD acquisition costs
[AD-P002828] p 76 N84-23373
Ohio State Univ., Columbus.
Analyzing program methodologies using software science
[AD-A138121] p 93 N84-22259
Expert systems for price analysis: A feasibility study
[AD-P002795] p 74 N84-23341
An intelligent manual for price analysis
[AD-P002798] p 75 N84-23344
The design of an expert system for contract price analysis
[AD-A140927] p 77 N84-28662
Oklahoma City Air Logistics Center, Tinker AFB, Okla.
Training acquisition personnel through a local college
[AD-P002766] p 6 N84-23313
Reshaping the philosophy of spare parts acquisition: Project PACER PRICE
[AD-P002791] p 82 N84-23338
Old Dominion Univ., Norfolk, Va.
Preferences on technical report format - Results of a survey
p 39 N84-33153
Report format preferences of technical managers and nonmanagers
p 40 N84-45572
Assessment of learning abilities using rate measures
[AD-P003340] p 8 N84-28463
Olivetti (C.) and C., S.p.A., Turin (Italy).
AMIX: An automated system for handling error notification data
p 91 N84-14734

P

Pacific Northwest Lab., Richland, Wash.
Management of QA in an R and D organization
[DE83-016924] p 90 N84-13014
ALDS project: Motivation, statistical database management issues, perspectives, and directions
[DE84-001412] p 44 N84-14983
Development of a document preparation staff within an office automation environment
[DE84-008649] p 55 N84-31041
Patent and Trademark Office, Washington, D. C.
Design patents
[PB83-224063] p 100 N84-14985
PEL, Inc., Baton Rouge, La.
Risk analysis: Comparing different contract types
[AD-P002788] p 74 N84-23335
Interactive risk analysis and development of standardized factors
[AD-A140758] p 77 N84-27473
Pennsylvania Univ., Philadelphia.
Evaluating organizational change through improved understanding of managerial schemata
p 21 N84-27596
Pittsburgh Univ., Pa.
Project management: Evolution and influence
[AD-P002824] p 64 N84-23369
Polytechnic Inst. of New York, Brooklyn.
Research in network management techniques for tactical data communications networks
[AD-A131357] p 40 N84-11365
Pratt and Whitney Aircraft Group, East Hartford, Conn.
Impact of corporate resource allocation decisions on national security objectives: Dissynergism in aerospace industrial resource planning
[AD-P002801] p 29 N84-23347
Price Waterhouse and Co., Washington, D. C.
Report on U.S. domestic and international telecommunications and information markets
[PB84-166362] p 77 N84-27602
Pro-Crit (Pty) Ltd., Randburg (South Africa).
Construction planning and control: Current practice and continuing challenges
p 28 N84-14706
Puerto Rico Univ., Mayaguez.
Microcomputers: A tool for planning and scheduling construction projects
[PB83-211201] p 27 N84-11053
Purdue Univ., Lafayette, Ind.
On using selection procedures with binomial models
[AD-A135275] p 16 N84-17957
Personnel technology: Performance appraisal, a process approach
[AD-A138359] p 4 N84-23112
Computer-automated technological innovation in three manufacturing sectors
[AD-P003309] p 35 N84-28450

R

RAND Corp., Santa Monica, Calif.
Information systems, security and privacy
[RAND/P-6930] p 47 N84-21402

T

- A development of logistics management models for the Space Transportation System [NASA-CR-173504] p 84 N84-23664
- Designing readable and reusable tables [RAND/P-6945] p 51 N84-24496
- Interactive information environments: A plan for enabling interdisciplinary research [RAND/N-2115] p 58 N84-33284
- Scientific and technical information transfer: Issues and options [RAND/N-2131-NSF] p 65 N84-33286
- Range Commanders Council, White Sands Missile Range, N. Mex.**
- Universal documentation system handbook - an introduction to the universal documentation system [AD-A140140] p 52 N84-25742
- Regional Planning Council, Baltimore, Md.**
- Scenario planning: Energy considerations in the long range urban transportation planning process [DE84-013590] p 87 N84-33308
- Rochester Univ., N. Y.**
- The ROE file system [AD-A140497] p 52 N84-26473
- Rolls-Royce Ltd., Derby (England).**
- Corporate DP planning: New approaches and new concerns [PNR-90180] p 50 N84-23386
- Rome Air Development Center, Griffiss AFB, N.Y.**
- The evolution and practical applications of failure modes and effects analyses [AD-A131358] p 90 N84-11778
- Automating the source selection process [AD-P002835] p 84 N84-23380
- Rutgers - The State Univ., New Brunswick, N. J.**
- A study of critical factors affecting the development of performance measures in evaluating bibliographic information retrieval systems p 41 N84-13030

S

- Sandia Labs., Albuquerque, N. Mex.**
- Algorithm 607 - Text exchange system: A transportable system for management and exchange of programs and other text p 39 N84-44325
- Quality Assurance (QA) procedures for computer software in department 1510 [DE84-012131] p 95 N84-30778
- DBMS conversion case study [DE84-011205] p 55 N84-31054
- Technology transfer revisited [DE84-012233] p 65 N84-32293
- Sandia National Laboratories administrative data processing systems [DE84-014328] p 59 N84-34202
- School of Aerospace Medicine, Brooks AFB, Tex.**
- Organizational-climate dimensions: A conceptual and judgmental analysis [AD-A132698] p 15 N84-16068
- A set of organizational-climate measures: Internal consistency, factor structure, and predictive power [AD-A135352] p 16 N84-19132
- Science Applications, Inc., McLean, Va.**
- Cost realism: Assuring more realistic contractor cost proposals [AD-P002800] p 75 N84-23346
- Parts on demand: Evaluation of approaches to achieve flexible manufacturing systems for Navy parts on demand, volume 1 [AD-A143248] p 31 N84-32830
- Selenia Industrie Associate S.p.A., Rome (Italy).**
- An approach to logistic problems by the L-transform method p 80 N84-15884
- The life cycle cost of integrated logistic support p 85 N84-26962
- Singer Co., Binghamton, N.Y.**
- A comparison of simulator procurement/program practices: Military versus commercial [AD-P003453] p 86 N84-32230
- Effectiveness of multi-year and advance procurement contracts [AD-P003462] p 86 N84-32239
- Data base management of software development [AD-P003486] p 57 N84-32253
- Societe Nationale Industrielle Aerospatiale, Les Mureaux (France).**
- Quality control in large systems development phase [SNIAS-832-422-102] p 94 N84-25074
- Text processing in the writing of contracts [SNIAS-841-422-102] p 65 N84-32297
- Societe Nationale Industrielle Aerospatiale, Paris (France).**
- Value and competition [SNIAS-832-501-101] p 76 N84-25504

- Softech, Inc., Waltham, Mass.**
- Integrated Computer-Aided Manufacturing (ICAM) architecture part 3. Volume 1: Architecture part 3: Accomplishments [AD-A134249] p 33 N84-16829
- Configuration management with the Ada (trademark) language [AD-P003416] p 55 N84-30748
- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 5: Composite function model of manufacture product (MFG0) [AD-A142337] p 35 N84-30766
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers' guide: Volume 1 [AD-A142430] p 10 N84-30768
- Ada (registered trademark) training curriculum. Ada (registered trademark) for software managers, L201. Teachers' guide: Volume 2 [AD-A142431] p 10 N84-30769
- Ada (Registered trademark) training curriculum. Software engineering for managers. M101: Teachers' guide [AD-A142432] p 10 N84-30770
- Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, volume 4: Composite information model of design product (DES 1) [AD-A142447] p 36 N84-30774
- The evolution of the JOVIAL/J73 language from definition to use [AD-P003518] p 56 N84-31122
- Ada (Trademark) training considerations [AD-P003560] p 10 N84-31164
- Integrated Computer-Aided Manufacturing (ICAM) architecture. Part 3, Volume 6: Composite information model of 'Manufacture product' (MFG1) [AD-A143072] p 36 N84-31973
- Integrated Computer-Aided Manufacturing (ICAM) architecture, part 3. Volume 7: MFG01 glossary [AD-A144426] p 36 N84-34991
- Softlab G.m.b.H., Munich (West Germany).**
- The project library PLUS: A general overview p 43 N84-14751
- SoHaR, Inc., Los Angeles, Calif.**
- Microcomputers: Introduction to features and uses [PB84-178821] p 53 N84-27456
- South African Bureau of Standards, Pretoria.**
- Management input in quality p 92 N84-17602
- South African Inst. of Civil Engineers, Pretoria.**
- Computer simulation of construction operations p 28 N84-14704
- Is critical path planning the answer p 15 N84-14705
- SRI International Corp., Menlo Park, Calif.**
- Recommendations for NASA research and development in artificial intelligence [NASA-CR-170585] p 32 N84-11817
- Stanford Univ., Calif.**
- Search among queues [AD-A131639] p 70 N84-12773
- Universal relation database systems [AD-A135707] p 46 N84-19176
- Starke (Basil) (Pty) Ltd., Cape Town (South Africa).**
- Computers for the smaller contractors p 28 N84-14703
- State Univ. of New York, Stony Brook.**
- Computer networks without a shared memory AFOSR-81-0197 [AD-A135074] p 45 N84-17927
- The impact of communicating through computers p 53 N84-27457
- Synergy, Inc., Washington, D. C.**
- Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 3 [AD-A131878] p 27 N84-12051
- Develop a normative or descriptive model of the international/domestic civil aviation industry, volume 2 [AD-A131877] p 27 N84-12052
- Develop a normative or descriptive model of the international/domestic civil aviation industry. Volume 1: Executive summary [AD-A131876] p 27 N84-12053
- Syracuse Univ., Utica, N. Y.**
- Information retrieval research support [AD-A131990] p 41 N84-13022
- System Development Corp., McLean, Va.**
- Guideline for computer security certification and accreditation. Category: ADP (Automatic Data Processing) operations. Subcategory: Computer security. Federal information processing standards [FIPS-PUB-102] p 55 N84-30736

Technische Hochschule, Aachen (West Germany).

- Stochastic bounds on distributions of optimal value functions with applications to PERT, network flow and reliability [REPT-81] p 21 N84-27593
- Technische Hogeschool, Delft (Netherlands).**
- Fault management p 23 N84-30709
- Technische Univ., Munich (West Germany).**
- On a series of problems with machines: Costs of modernization and storage in case of demand [TUM-M8312] p 30 N84-25883
- Technische Univ., Vienna (Austria).**
- EDDA: A very high level data flow specification language p 42 N84-14735
- TECSI-Software, Paris (France).**
- Coherent management support in the Ada environment p 43 N84-14748
- Terra-Mar, Mountain View, Calif.**
- Alternative strategies for space station financing [NASA-CR-175412] p 72 N84-21437
- Texas A&M Univ., College Station.**
- The nature and use of formal control systems for management control and strategy implementation [AD-A139083] p 20 N84-24493
- Factor stability and construct validation of Yukl's MBS (Managerial Behavior Survey) for military leadership [AD-P003246] p 21 N84-28413
- An exploratory analysis of the relationship between media richness and managerial information processing [AD-A143503] p 24 N84-33293

U

- Ultracom, Inc., Del Mar, Calif.**
- Development of a proposed standard for the exchange of scientific microcomputer programs [PB84-157940] p 94 N84-24244
- Umgeni Water Board, Pietermaritzburg (South Africa).**
- Integrated budget control using a desktop computer p 70 N84-14697
- United Nations Industrial Development Organization, Vienna (Austria).**
- Licensing computer software: Basic considerations as to protection and licensing of computer software and its implications for developing countries [PB84-150689] p 101 N84-22295
- University of Northern Illinois, De Kalb.**
- Tools for the creation of IMS database designs from Entity-Relationship diagrams [DE84-000592] p 42 N84-14066
- University of Southern California, Los Angeles.**
- Performance appraisal revisited [AD-A132841] p 3 N84-16059
- Organizational outcomes of creativity [AD-A132825] p 3 N84-16066
- The design of effective reward systems [AD-A132859] p 3 N84-16067
- Motivation and performance appraisal behavior [AD-A134311] p 3 N84-17842
- Design of office information systems [AD-A136523] p 46 N84-19170
- Equal weights, flat maxima, and trivial decisions [AD-A138506] p 18 N84-22342
- Assumption of risk in the R and D environment [AD-P002757] p 72 N84-23304
- An application of the causal-integrative model [AD-P002786] p 18 N84-23333
- University of Western Carolina, Cullowhee, N.C.**
- The impact of factory automation and robotics on the contracting and acquisition processes [AD-P002830] p 34 N84-23375
- Urban Inst., Washington, D.C.**
- Motivating managers: A guide to performance targeting and performance-based pay in state and local governments [PB83-237834] p 14 N84-11978
- Urban Mass Transportation Administration, Washington, D.C.**
- Microcomputers in transportation: Software and source book [PB84-195155] p 87 N84-33067
- Veda, Inc., Dayton, Ohio.**
- Some management initiatives to improve embedded commercial computer and training device life cycle support [AD-P003494] p 11 N84-32260

V

Virginia Polytechnic Inst. and State Univ., Blacksburg.

GENIE: A computer-based task for experiments in human-computer interaction

[AD-A137473] p 3 N84-20181

An analysis of relationships among size, technology and structure in a contextually limited setting

p 21 N84-27597

Virginia Univ., Charlottesville.

Award fee contract provisions as a program management tool

[AD-P002776] p 63 N84-23323

VTI, Inc., Dayton, Ohio.

A cost based acquisition planning model utilizing expert system concepts

[AD-P002783] p 73 N84-23330

W**Walter Reed Army Medical Center, Washington, D.C.**

Age effects on active duty Army MMPI (Minnesota Multiphasic Personality Inventory) profiles

[AD-P003343] p 9 N84-28464

Washington Univ., Seattle.

Social support and performance in complex organizations

[AD-A138888] p 6 N84-24098

Physical performance tests as predictors of task performance

[AD-P003257] p 7 N84-28424

Wisconsin Univ., Madison.

Experimental design: Review and comment

[AD-A139268] p 19 N84-24309

Equitable assignment rules

[AD-A142809] p 24 N84-32268

Wisconsin Univ., Stevens Point.

Training decision-makers to be creative: A management process model

[AD-P003347] p 22 N84-28466

Y**Yale Univ., New Haven, Conn.**

A normative model of work team effectiveness

[AD-A136398] p 17 N84-20165

An intergroup perspective on group dynamics

[AD-A135582] p 17 N84-20167

Fiscal and monetary policy in a general equilibrium model

[AD-A138502] p 72 N84-22510

To the wilderness and beyond: The application of a model for transformal change

[AD-P003249] p 22 N84-28416

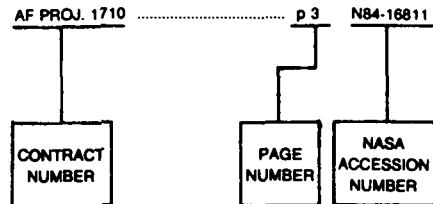
Young (Arthur) and Co., Washington, D. C.

Office automation management guide

[AD-A131770] p 41 N84-13012

CONTRACT NUMBER INDEX

Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number, the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the AIAA accession numbers appearing first. The accession number denotes the number by which the citation is identified in the abstract section. Preceding the accession number is the page number on which the citation may be found.

AF PROJ. 1710	p 3	N84-16811
	p 52	N84-28471
AF PROJ. 2304	p 32	N84-11821
	p 45	N84-17927
	p 80	N84-19028
	p 46	N84-19170
	p 46	N84-19176
	p 20	N84-26345
AF PROJ. 2305	p 33	N84-20730
AF PROJ. 2313	p 95	N84-29026
AF PROJ. 2338	p 90	N84-11778
	p 91	N84-14528
	p 91	N84-14529
AF PROJ. 2531	p 42	N84-13827
AF PROJ. 5581	p 41	N84-13022
	p 92	N84-21128
	p 92	N84-21129
	p 92	N84-21130
AF PROJ. 6810	p 51	N84-25354
AF PROJ. 7719	p 95	N84-29026
	p 12	N84-34169
AF PROJ. 7930	p 16	N84-19132
AF PROJ. 9993	p 54	N84-29786
	p 54	N84-29787
AF-AFOSR-0155-80	p 20	N84-26345
AF-AFOSR-0197-81	p 45	N84-17927
AF-AFOSR-0212-80	p 46	N84-19176
AF-AFOSR-0232-82	p 46	N84-19170
AF-AFOSR-0245-80	p 80	N84-19028
AF-AFOSR-0253-82	p 33	N84-20730
AF-AFOSR-80-0229	p 13	A84-21844
ARPA ORDER 4031	p 54	N84-29495
AT(29-1)-789	p 39	A84-44325
CHI PROJ. 793-R	p 100	N84-18095
DA PROJ. 2Q1-82717-A-779	p 23	N84-31037
DA PROJ. 2Q1-82722-A-791	p 3	N84-20184
	p 4	N84-20428
DA PROJ. 2Q2-82722-A-795	p 6	N84-26710
DA PROJ. 2Q2-83731-A-792	p 23	N84-28665
DA PROJ. 2Q2-83743-A-794	p 2	N84-14683
	p 19	N84-24490
	p 19	N84-24491
DA PROJ. 4A7-82731-AT-41	p 30	N84-31971
	p 30	N84-31972
DA PROJ. 7930	p 15	N84-16068
DAAB07-83-C-K514	p 10	N84-30768
	p 10	N84-30769
	p 10	N84-30770
DAAG29-80-C-0041	p 19	N84-24309
	p 24	N84-32268
DAAG29-80-K-0061	p 83	N84-22259

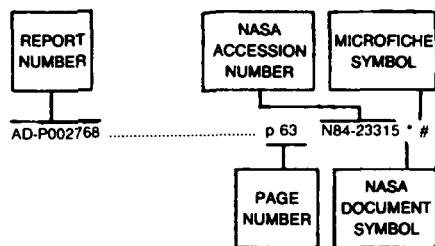
DAAK80-80-C-0507	p 55	N84-30748
DAAK80-80-K-0579	p 40	N84-11365
DAAK80-81-C-0187	p 10	N84-31164
DCA100-78-C-0053	p 44	N84-17049
DE-AC01-80RA-50256	p 14	N84-33465
DE-AC01-82CE-15095	p 56	N84-31056
DE-AC01-82CE-15151	p 102	N84-31038
	p 102	N84-31039
DE-AC03-76SF-00098	p 48	N84-22281
	p 52	N84-25522
DE-AC04-76DP-00656	p 55	N84-29802
DE-AC04-76DP-00789	p 95	N84-30778
	p 55	N84-31054
	p 65	N84-32293
	p 59	N84-34202
DE-AC05-84OR-21400	p 87	N84-32296
DE-AC06-76FF-02170	p 90	N84-12510
DE-AC06-76RL-01830	p 90	N84-13014
	p 44	N84-14983
	p 55	N84-31041
DE-AC09-76SR-00001	p 81	N84-21112
DE-AI01-81CS-90103	p 87	N84-33308
DE-FG01-82NE-37887	p 25	A84-19449
DOT-FA01-82-C-10003	p 79	A84-44732
DTFA01-84-C-0010	p 86	N84-29848
F19628-78-C-0163	p 54	N84-29786
	p 54	N84-29787
F19628-81-C-0101	p 31	A84-17159
F19628-82-C-0001	p 45	N84-17891
	p 71	N84-20247
F19628-84-C-0001	p 51	N84-25354
F30602-79-C-0195	p 41	N84-13022
F30602-80-C-0291	p 43	N84-14766
F30602-80-C-0330	p 92	N84-21128
	p 92	N84-21129
F30602-81-C-0190	p 92	N84-21130
	p 91	N84-14528
	p 91	N84-14529
F30602-81-C-0213	p 42	N84-13827
F3062-80-C-0284	p 39	A84-41201
F33615-79-C-0027	p 52	N84-26471
F33615-80-C-5103	p 85	N84-28663
F33615-80-C-5109	p 33	N84-16829
	p 35	N84-30766
	p 36	N84-30774
	p 36	N84-31973
	p 36	N84-34991
F33615-81-C-5119	p 37	N84-34999
F33615-82-C-5095	p 85	N84-27588
F33615-82-C-5114	p 74	N84-23341
	p 75	N84-23344
	p 77	N84-28662
F33615-82-C-5121	p 84	N84-23381
	p 85	N84-29788
	p 77	N84-27473
F33615-83-K-5075	p 8	N84-28463
F41689-83-C-0016	p 32	N84-11821
F49620-82-K-0009	p 27	N84-12051
F49642-81-C-0237	p 27	N84-12052
	p 27	N84-12053
F57-526	p 4	N84-20187
F60-433	p 71	N84-20444
MDA903-78-C-0294	p 71	N84-18158
MDA903-79-C-0018	p 33	N84-19827
	p 33	N84-20867
MDA903-79-C-0330	p 23	N84-31037
MDA903-79-C-0690	p 41	N84-13012
MDA903-80-M-8914	p 23	N84-28665
MDA903-81-C-0166	p 79	N84-14115
	p 71	N84-18092
	p 95	N84-28763
	p 54	N84-29798
MDA903-81-C-0541	p 3	N84-20184
	p 4	N84-20428
MDA903-81-M-4220	p 19	N84-24491
MDA903-82-C-0339	p 16	N84-19129
MDA903-82-G-0055	p 15	N84-13010
MDA903-83-C-0342	p 46	N84-20425
	p 46	N84-20426
NAGW-448	p 44	N84-16824
NASW-3425	p 52	N84-26317
	p 52	N84-26318
	p 55	N84-30737

NASW-3750	p 72	N84-21437
NASW-3775	p 77	N84-27756
NASW-3787	p 94	N84-23401
NAS1-14700	p 32	A84-30608
	p 30	N84-28776
NAS10-10438	p 84	N84-23664
NAS5-27338	p 32	N84-11817
NAS7-100	p 43	N84-14749
NAS7-918	p 9	N84-28485
NAS8-34901	p 71	N84-15165
NB82SB-C-A1654	p 53	N84-27456
NIVR-1870	p 72	N84-22287
NR PROJ. 047-607	p 15	N84-12784
	p 17	N84-20427
NR PROJ. 049-345	p 40	N84-10786
NRC-G-04-81-002	p 25	A84-19449
NSF DAR-78-261622	p 14	N84-11978
NSF ECS-82-05425	p 17	N84-20427
NSF ENG-79-03605	p 14	N84-33465
NSF ISI-81-05585	p 63	N84-14971
	p 63	N84-14972
NSF IST-80-25761	p 52	N84-26473
NSF MCS-78-22328	p 34	N84-22317
NSF MCS-81-04008	p 52	N84-26473
NSF MCS-82-10950	p 19	N84-24309
NSF OIR-82-12617	p 19	N84-24102
NSF OIR-83-12023	p 45	N84-18619
NSF PRA-79-20587	p 100	N84-18095
NSF PRA-84-00609	p 65	N84-33286
NSF SES-83-42754	p 72	N84-22510
NSG-1625	p 79	A84-45666
NSG-5123	p 49	N84-23139
N00014-75-C-0455	p 16	N84-17957
N00014-76-C-0243	p 12	N84-34162
N00014-76-C-0302	p 16	N84-16925
N00014-77-C-0518	p 72	N84-22510
N00014-79-C-0038	p 18	N84-22342
N00014-79-C-0338	p 4	N84-20185
N00014-79-C-0424	p 13	A84-19141
N00014-79-C-0650	p 20	N84-25353
N00014-79-C-0658	p 9	N84-29480
N00014-79-C-0685	p 70	N84-12773
N00014-80-C-0522	p 6	N84-24098
N00014-80-C-0542	p 14	A84-33463
N00014-80-C-0555	p 17	N84-20165
N00014-81-C-0019	p 4	N84-20185
N00014-81-K-0048	p 3	N84-16059
	p 3	N84-16066
	p 3	N84-16067
	p 3	N84-17842
N00014-81-K-0143	p 3	N84-20181
N00014-81-0143	p 1	A84-21640
N00014-82-C-0845	p 31	N84-32830
N00014-82-K-0193	p 52	N84-26473
N00014-82-K-0329	p 15	N84-12784
	p 17	N84-20427
N00014-82-K-0449	p 4	N84-23112
N00014-82-K-0469	p 13	A84-19141
N00014-82-K-0715	p 17	N84-20167
N00014-83-C-0025	p 20	N84-24493
	p 24	N84-33293
N00014-83-C-0495	p 24	N84-34191
N00014-83-K-0193	p 23	N84-30717
N00014-83-K-0257	p 40	N84-10786
N00014-83-K-0742	p 23	N84-29437
N00039-82-C-0235	p 54	N84-29495
N66001-83-G-0294	p 54	N84-28673
OPM-79-DX-08	p 14	N84-11978
RR0-0001	p 35	N84-25357
RR0-1409-41	p 71	N84-21122
RR0-4204	p 12	N84-34162
RR0-4208	p 4	N84-23112
RR0-4209	p 3	N84-20181
RR140941	p 41	N84-11781
R18-688	p 24	N84-34191
SF57525001	p 2	N84-14713
SRI PROJ. 4716	p 32	N84-11817
W-31-109-ENG-38	p 62	N84-11977
	p 42	N84-14066
	p 6	N84-25524
W-7405-ENG-26	p 40	N84-11066
	p 43	N84-14958
	p 28	N84-14984

	p 16	N84-18094
	p 63	N84-21397
W-7405-ENG-36	p 40	N84-10807
	p 2	N84-14795
	p 15	N84-14969
W-7405-ENG-48	p 2	N84-13013
	p 33	N84-13868
	p 51	N84-25387
505-34-01	p 56	N84-31112
533-02-81	p 63	N84-14965
844-11-00	p 9	N84-28485

REPORT NUMBER INDEX

Typical Report Number Index Listing



Listings in this index are arranged alphanumerically by report number. The page number indicates the page on which the citation is located. The accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche.

AAS PAPER 83-221	p 98	A84-29865	#
AAS PAPER 83-225	p 98	A84-29868	#
AAS PAPER 83-227	p 99	A84-29870	#
AAS PAPER 83-242	p 68	A84-29881	#
AAS PAPER 83-243	p 68	A84-29882	#
AAS PAPER 83-244	p 68	A84-29883	#
AAS PAPER 83-246	p 68	A84-29885	#
ACSC-84-1345	p 59	N84-34316	#
ACSC-84-2225	p 11	N84-33252	#
ACSC-84-2780	p 24	N84-33253	#
AD-A130622	p 40	N84-10786	#
AD-A131043	p 90	N84-11048	#
AD-A131332	p 41	N84-11781	#
AD-A131357	p 40	N84-11365	#
AD-A131358	p 90	N84-11778	#
AD-A131382	p 32	N84-11821	#
AD-A131596	p 15	N84-13010	#
AD-A131639	p 70	N84-12773	#
AD-A131651	p 41	N84-12747	#
AD-A131770	p 41	N84-13012	#
AD-A131876	p 27	N84-12053	#
AD-A131877	p 27	N84-12052	#
AD-A131878	p 27	N84-12051	#
AD-A131964	p 41	N84-13023	#
AD-A131990	p 41	N84-13022	#
AD-A132004	p 15	N84-12784	#
AD-A132164	p 32	N84-13867	#
AD-A132211	p 15	N84-14062	#
AD-A132320	p 42	N84-13827	#
AD-A132367	p 79	N84-13146	#
AD-A132565	p 2	N84-14683	#
AD-A132569	p 42	N84-13818	#
AD-A132657	p 2	N84-14713	#
AD-A132764	p 53	N84-28670	#
AD-A132795	p 85	N84-28671	#
AD-A132825	p 3	N84-16066	#
AD-A132841	p 3	N84-16059	#
AD-A132859	p 3	N84-16067	#
AD-A132898	p 15	N84-16068	#
AD-A132927	p 79	N84-14115	#
AD-A132990	p 15	N84-14966	#
AD-A132998	p 43	N84-14980	#
AD-A133023	p 70	N84-14967	#
AD-A133052	p 2	N84-15796	#
AD-A133354	p 3	N84-16811	#
AD-A133438	p 33	N84-15805	#
AD-A133589	p 71	N84-16801	#
AD-A133624	p 91	N84-14529	#
AD-A133625	p 91	N84-14528	#
AD-A133642	p 80	N84-14711	#
AD-A133865	p 81	N84-14709	#
AD-A134092	p 43	N84-14766	#
AD-A134167	p 44	N84-17049	#

AD-A134228	p 44	N84-16432	#
AD-A134249	p 33	N84-16829	#
AD-A134255	p 16	N84-16925	#
AD-A134311	p 3	N84-17842	#
AD-A134363	p 44	N84-16830	#
AD-A134424	p 45	N84-17054	#
AD-A134466	p 44	N84-16831	#
AD-A134661	p 71	N84-18092	#
AD-A134930	p 45	N84-17891	#
AD-A134974	p 80	N84-18108	#
AD-A135074	p 45	N84-17927	#
AD-A135275	p 16	N84-17957	#
AD-A135352	p 16	N84-19132	#
AD-A135518	p 45	N84-18107	#
AD-A135571	p 80	N84-19175	#
AD-A135582	p 17	N84-20167	#
AD-A135620	p 80	N84-19028	#
AD-A135638	p 80	N84-19126	#
AD-A135639	p 16	N84-19127	#
AD-A135707	p 46	N84-19176	#
AD-A135863	p 17	N84-20166	#
AD-A135958	p 4	N84-20428	#
AD-A136020	p 16	N84-19129	#
AD-A136035	p 71	N84-18158	#
AD-A136230	p 16	N84-19124	#
AD-A136398	p 17	N84-20165	#
AD-A136523	p 46	N84-19170	#
AD-A136572	p 33	N84-18924	#
AD-A136739	p 3	N84-20184	#
AD-A136776	p 46	N84-20438	#
AD-A136780	p 4	N84-20185	#
AD-A136840	p 46	N84-20425	#
AD-A136841	p 46	N84-20426	#
AD-A136873	p 81	N84-19280	#
AD-A136918	p 4	N84-20187	#
AD-A136983	p 17	N84-20427	#
AD-A137057	p 46	N84-20244	#
AD-A137084	p 71	N84-20247	#
AD-A137311	p 17	N84-20424	#
AD-A137329	p 33	N84-19827	#
AD-A137351	p 71	N84-20444	#
AD-A137460	p 81	N84-19390	#
AD-A137473	p 3	N84-20181	#
AD-A137491	p 72	N84-22511	#
AD-A137639	p 71	N84-21122	#
AD-A137761	p 33	N84-20867	#
AD-A137808	p 4	N84-21104	#
AD-A137891	p 33	N84-20730	#
AD-A137943	p 17	N84-21395	#
AD-A137955	p 92	N84-21128	#
AD-A137956	p 92	N84-21129	#
AD-A137957	p 92	N84-21130	#
AD-A138059	p 54	N84-28672	#
AD-A138121	p 93	N84-22259	#
AD-A138205	p 5	N84-23292	#
AD-A138359	p 4	N84-23112	#
AD-A138398	p 34	N84-22270	#
AD-A138502	p 72	N84-22510	#
AD-A138506	p 18	N84-22342	#
AD-A138589	p 19	N84-24490	#
AD-A138851	p 64	N84-23384	#
AD-A138871	p 19	N84-24491	#
AD-A138888	p 6	N84-24098	#
AD-A138952	p 34	N84-23122	#
AD-A139078	p 102	N84-24492	#
AD-A139083	p 20	N84-24493	#
AD-A139268	p 19	N84-24309	#
AD-A139430	p 19	N84-24489	#
AD-A139825	p 20	N84-25353	#
AD-A139840	p 51	N84-25354	#
AD-A139845	p 76	N84-25505	#
AD-A139991	p 35	N84-25357	#
AD-A140127	p 51	N84-25329	#
AD-A140140	p 52	N84-25742	#
AD-A140309	p 52	N84-26471	#
AD-A140391	p 6	N84-26303	#
AD-A140465	p 84	N84-25612	#
AD-A140473	p 84	N84-26460	#
AD-A140496	p 20	N84-26345	#
AD-A140497	p 52	N84-26473	#
AD-A140556	p 65	N84-27585	#
AD-A140606	p 30	N84-26650	#
AD-A140627	p 85	N84-27587	#

AD-A140709	p 53	N84-27472	#
AD-A140728	p 84	N84-26690	#
AD-A140751	p 85	N84-27588	#
AD-A140758	p 77	N84-27473	#
AD-A140815	p 6	N84-26710	#
AD-A140864	p 20	N84-27591	#
AD-A140901	p 21	N84-27592	#
AD-A140927	p 77	N84-28662	#
AD-A140930	p 85	N84-28663	#
AD-A140979	p 23	N84-28665	#
AD-A140982	p 53	N84-28666	#
AD-A141040	p 54	N84-28673	#
AD-A141396	p 54	N84-29786	#
AD-A141397	p 54	N84-29787	#
AD-A141408	p 85	N84-29788	#
AD-A141455	p 9	N84-29480	#
AD-A141492	p 95	N84-28763	#
AD-A141503	p 54	N84-29798	#
AD-A141711	p 95	N84-29026	#
AD-A141712	p 23	N84-29437	#
AD-A141758	p 54	N84-29799	#
AD-A141925	p 88	N84-31033	#
AD-A142177	p 54	N84-29495	#
AD-A142295	p 86	N84-29848	#
AD-A142337	p 35	N84-30766	#
AD-A142387	p 77	N84-31062	#
AD-A142389	p 23	N84-31035	#
AD-A142430	p 10	N84-30768	#
AD-A142431	p 10	N84-30769	#
AD-A142432	p 10	N84-30770	#
AD-A142447	p 36	N84-30774	#
AD-A142450	p 23	N84-31037	#
AD-A142677	p 23	N84-30717	#
AD-A142775	p 11	N84-32266	#
AD-A142809	p 24	N84-32268	#
AD-A143031	p 30	N84-31971	#
AD-A143032	p 30	N84-31972	#
AD-A143072	p 36	N84-31973	#
AD-A143161	p 57	N84-31494	#
AD-A143248	p 31	N84-32830	#
AD-A143315	p 11	N84-33252	#
AD-A143316	p 24	N84-33253	#
AD-A143438	p 87	N84-33290	#
AD-A143503	p 24	N84-33293	#
AD-A143599	p 59	N84-34323	#
AD-A143630	p 24	N84-34191	#
AD-A143875	p 59	N84-34326	#
AD-A144006	p 59	N84-34316	#
AD-A144017	p 12	N84-34317	#
AD-A144045	p 87	N84-33366	#
AD-A144065	p 12	N84-34162	#
AD-A144067	p 12	N84-34169	#
AD-A144212	p 37	N84-35126	#
AD-A144426	p 36	N84-34991	#
AD-A144523	p 59	N84-35131	#
AD-A144556	p 103	N84-34454	#
AD-A144691	p 37	N84-34999	#
AD-A145193	p 47	N84-21402	#
AD-A145254	p 51	N84-24496	#
AD-A145379	p 86	N84-31107	#
AD-B079998	p 72	N84-22287	#
AD-B084828	p 36	N84-31984	#
AD-E000556	p 17	N84-20165	#
AD-E401119	p 24	N84-32268	#
AD-E500603	p 33	N84-19827	#
AD-E500616	p 33	N84-20867	#
AD-E750844	p 33	N84-15805	#
AD-E751074	p 59	N84-34316	#
AD-E751074	p 12	N84-34317	#
AD-E850405	p 32	N84-13867	#
AD-E900298	p 4	N84-21104	#
AD-F630004	p 18	N84-22342	#
AD-F630031	p 79	N84-14115	#
AD-P002148	p 94	N84-23813	#
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AD-P002749	p 49	N84-23296	#
AD-P002750	p 49	N84-23297	#
AD-P002751	p 50	N84-23298	#

AD-P002752	p 81	N84-23299	#	AD-P003343	p 9	N84-28464	#	ARI-RN-83-50	p 4	N84-20428	#
AD-P002753	p 29	N84-23300	#	AD-P003347	p 22	N84-28466	#	ARI-RN-83-51	p 3	N84-20184	#
AD-P002754	p 72	N84-23301	#	AD-P003349	p 9	N84-28467	#	ARI-RN-84-55	p 19	N84-24490	#
AD-P002755	p 18	N84-23302	#	AD-P003351	p 22	N84-28468	#	ARI-RN-84-72	p 23	N84-28665	#
AD-P002756	p 81	N84-23303	#	AD-P003361	p 9	N84-28474	#	ARI-RN-84-91	p 23	N84-31037	#
AD-P002757	p 72	N84-23304	#	AD-P003366	p 65	N84-28479	#	ARI-RP-83-7	p 2	N84-14683	#
AD-P002758	p 18	N84-23305	#	AD-P003368	p 9	N84-28480	#	ARI-TR-588	p 6	N84-26710	#
AD-P002760	p 5	N84-23307	#	AD-P003416	p 55	N84-30748	#	ARI-13AR119	p 9	N84-28485 *	#
AD-P002761	p 63	N84-23308	#	AD-P003453	p 86	N84-32230	#	ARI-13AR183-35	p 9	N84-28485 *	#
AD-P002763	p 5	N84-23310	#	AD-P003454	p 10	N84-32231	#	ARINC-RES-PUBL-3104-01-TR-310	p 94	N84-23401 *	#
AD-P002764	p 5	N84-23311	#	AD-P003455	p 10	N84-32232	#	ARO-17150.4-EL	p 93	N84-22259	#
AD-P002765	p 5	N84-23312	#	AD-P003457	p 11	N84-32234	#	ASME PAPER 83-WA/AERO-11	p 32	A84-30608 *	#
AD-P002766	p 6	N84-23313	#	AD-P003462	p 86	N84-32239	#	ASME PAPER 83-WA/MGT-4	p 69	A84-30646	#
AD-P002767	p 72	N84-23314	#	AD-P003463	p 86	N84-32240	#	B-202205	p 103	N84-31044	#
AD-P002768	p 63	N84-23315	#	AD-P003464	p 11	N84-32241	#	BBN-5238	p 42	N84-13827	#
AD-P002769	p 101	N84-23316	#	AD-P003486	p 57	N84-32253	#	BBN-5499	p 4	N84-20185	#
AD-P002770	p 73	N84-23317	#	AD-P003488	p 57	N84-32255	#	BRMC-80-5103	p 85	N84-28663	#
AD-P002771	p 29	N84-23318	#	AD-P003493	p 87	N84-32259	#	BRMC-82-C-5121	p 85	N84-29788	#
AD-P002772	p 29	N84-23319	#	AD-P003494	p 11	N84-32260	#	BRMC-82-5095-4	p 85	N84-27588	#
AD-P002773	p 73	N84-23320	#	AD-P003496	p 87	N84-32262	#	BRMC-82-5114-3	p 77	N84-28662	#
AD-P002774	p 73	N84-23321	#	AD-P003497	p 77	N84-32263	#	BRMC-83-5075	p 77	N84-27473	#
AD-P002775	p 81	N84-23322	#	AD-P003518	p 56	N84-31122	#	BB212184	p 57	N84-32302	#
AD-P002776	p 63	N84-23323	#	AD-P003560	p 10	N84-31164	#	CECOM-80-0579-F	p 40	N84-11365	#
AD-P002777	p 101	N84-23324	#	AD-P003561	p 95	N84-31166	#	CERL-TR-P-158-VOL-1	p 30	N84-31971	#
AD-P002778	p 101	N84-23325	#	AD-P003570	p 95	N84-31175	#	CERL-TR-P-158-VOL-2	p 30	N84-31972	#
AD-P002779	p 82	N84-23326	#	AD-P003574	p 56	N84-31179	#	CMU-RI-TR-83-11	p 33	N84-15805	#
AD-P002780	p 82	N84-23327	#	AD-P003581	p 95	N84-31192	#	CMU-RI-TR-83-21	p 17	N84-20424	#
AD-P002781	p 73	N84-23328	#	AD-P003591	p 56	N84-31196	#	CO-ONR-010	p 6	N84-24098	#
AD-P002782	p 73	N84-23329	#	AD-P003592	p 57	N84-31197	#	CONF-8006272-1	p 48	N84-22281	#
AD-P002783	p 73	N84-23330	#	AFHRL-TP-83-34	p 3	N84-16811	#	CONF-8210120	p 40	N84-11066	#
AD-P002784	p 50	N84-23331	#	AFHRL-TP-84-11	p 12	N84-34169	#	CONF-830475-2	p 90	N84-12510	#
AD-P002785	p 50	N84-23332	#	AFHRL-TR-83-52	p 52	N84-26471	#	CONF-830535-3	p 90	N84-13014	#
AD-P002786	p 18	N84-23333	#	AFHRL-TR-83-57	p 95	N84-29026	#	CONF-8309159-1	p 33	N84-13868	#
AD-P002787	p 74	N84-23334	#	AFIT-LSSR-10-83	p 44	N84-16830	#	CONF-8309188-1	p 47	N84-21396	#
AD-P002788	p 74	N84-23335	#	AFIT-LSSR-106-83	p 80	N84-19126	#	CONF-830950-1	p 44	N84-14983	#
AD-P002789	p 64	N84-23336	#	AFIT-LSSR-118-83	p 16	N84-19127	#	CONF-830950-2	p 52	N84-25522	#
AD-P002791	p 82	N84-23338	#	AFIT-LSSR-36-83	p 45	N84-17054	#	CONF-8310131-2	p 28	N84-14984	#
AD-P002792	p 74	N84-23339	#	AFIT-LSSR-54-83	p 44	N84-16831	#	CONF-8310161-1	p 42	N84-14066	#
AD-P002793	p 74	N84-23340	#	AFIT-LSSR-61-83	p 80	N84-18108	#	CONF-8310190-1	p 43	N84-14968	#
AD-P002794	p 74	N84-23341	#	AFIT-LSSR-66-83	p 87	N84-33290	#	CONF-8310260-1	p 55	N84-29802	#
AD-P002795	p 74	N84-23342	#	AFIT-LSSR-91-83	p 80	N84-19175	#	CONF-831096-1	p 2	N84-13013	#
AD-P002796	p 75	N84-23344	#	AFIT/CI/NR-83-26D	p 70	N84-14967	#	CONF-831202-1	p 15	N84-14969	#
AD-P002798	p 75	N84-23345	#	AFIT/CI/NR-83-28D	p 42	N84-13818	#	CONF-831202-2	p 2	N84-14795	#
AD-P002799	p 75	N84-23346	#	AFIT/CI/NR-83-54T	p 44	N84-16432	#	CONF-840276-1	p 55	N84-31041	#
AD-P002800	p 75	N84-23347	#	AFIT/CI/NR-83-77D	p 17	N84-20166	#	CONF-8405126-1	p 51	N84-25367	#
AD-P002801	p 29	N84-23348	#	AFIT/CI/NR-83-94D	p 19	N84-24489	#	CONF-8405148-1	p 55	N84-31054	#
AD-P002802	p 29	N84-23349	#	AFIT/GCS/EE/83D-10	p 54	N84-28672	#	CONF-8405184-1	p 65	N84-32293	#
AD-P002804	p 82	N84-23350	#	AFIT/GCS/EE/84M-1	p 53	N84-28666	#	CSC-DDN-TE-1	p 44	N84-17049	#
AD-P002805	p 82	N84-23351	#	AFOSR-83-0658TR	p 32	N84-11821	#	CSIE-83-10	p 3	N84-20181	#
AD-P002806	p 82	N84-23352	#	AFOSR-83-0818TR	p 80	N84-19028	#	CSIR-TWISK-294	p 20	N84-25403	#
AD-P002807	p 83	N84-23353	#	AFOSR-83-0930TR	p 45	N84-17927	#	DCA-P-98	p 76	N84-25505	#
AD-P002808	p 83	N84-23354	#	AFOSR-83-0962TR	p 46	N84-19176	#	DE83-011175	p 15	N84-14969	#
AD-P002809	p 83	N84-23355	#	AFOSR-83-1122TR	p 20	N84-26345	#	DE83-012166	p 90	N84-12510	#
AD-P002810	p 75	N84-23356	#	AFOSR-83-1253TR	p 46	N84-19170	#	DE83-013229	p 40	N84-10807	#
AD-P002812	p 75	N84-23358	#	AFOSR-84-0031TR	p 33	N84-20730	#	DE83-014454	p 62	N84-11977	#
AD-P002816	p 93	N84-23361	#	AFSC-TR-82-01	p 64	N84-23384	#	DE83-014781	p 40	N84-11066	#
AD-P002817	p 93	N84-23362	#	AFSC-TR-84-001	p 30	N84-26650	#	DE83-014949	p 2	N84-13013	#
AD-P002818	p 93	N84-23363	#	AFSC-TR-84-02	p 64	N84-23384	#	DE83-016924	p 90	N84-13014	#
AD-P002819	p 93	N84-23364	#	AFWAL-TR-82-4063-VOL-1-3	p 33	N84-16829	#	DE83-017373	p 33	N84-13868	#
AD-P002820	p 94	N84-23365	#	AFWAL-TR-82-4063-VOL-4	p 36	N84-30774	#	DE84-000592	p 42	N84-14066	#
AD-P002821	p 94	N84-23366	#	AFWAL-TR-82-4063-VOL-5	p 35	N84-30766	#	DE84-001412	p 44	N84-14983	#
AD-P002822	p 64	N84-23367	#	AFWAL-TR-82-4063-VOL-6	p 36	N84-31973	#	DE84-001653	p 43	N84-14968	#
AD-P002823	p 19	N84-23368	#	AFWAL-TR-82-4063-VOL-7	p 36	N84-34991	#	DE84-001655	p 28	N84-14984	#
AD-P002824	p 64	N84-23369	#	AFWAL-TR-82-4201	p 86	N84-31033	#	DE84-002997	p 16	N84-18094	#
AD-P002825	p 50	N84-23370	#	AFWAL-TR-83-4000	p 86	N84-31033	#	DE84-005179	p 81	N84-21112	#
AD-P002826	p 83	N84-23371	#	AFWAL-TR-84-4020-VOL-4	p 37	N84-34999	#	DE84-005866	p 52	N84-25522	#
AD-P002827	p 75	N84-23372	#	AIAA PAPER 83-2329	p 37	A84-10011 *	#	DE84-006059	p 48	N84-22281	#
AD-P002828	p 76	N84-23373	#	AIAA PAPER 83-2334	p 38	A84-10065 *	#	DE84-006320	p 63	N84-21397	#
AD-P002829	p 83	N84-23374	#	AIAA PAPER 83-2336	p 37	A84-10015 *	#	DE84-008021	p 55	N84-29802	#
AD-P002830	p 34	N84-23375	#	AIAA PAPER 83-2349	p 31	A84-10022	#	DE84-008297	p 51	N84-25367	#
AD-P002831	p 76	N84-23376	#	AIAA PAPER 83-2356	p 88	A84-10026	#	DE84-008649	p 55	N84-31041	#
AD-P002832	p 64	N84-23377	#	AIAA PAPER 83-2357	p 88	A84-10027	#	DE84-009356	p 6	N84-25524	#
AD-P002833	p 101	N84-23378	#	AIAA PAPER 83-2358	p 88	A84-10028	#	DE84-010674	p 102	N84-31039	#
AD-P002834	p 83	N84-23379	#	AIAA PAPER 83-2360	p 66	A84-10029	#	DE84-010675	p 102	N84-31038	#
AD-P002835	p 84	N84-23380	#	AIAA PAPER 83-2405	p 37	A84-10048	#	DE84-010952	p 56	N84-31056	#
AD-P002836	p 84	N84-23381	#	AIAA PAPER 83-2427	p 37	A84-10062	#				
AD-P002837	p 84	N84-23382	#	AIAA PAPER 83-2711	p 78	A84-12316	#				
AD-P002838	p 30	N84-23383	#	AIAA PAPER 83-2776	p 88	A84-12356	#				
AD-P002839	p 21	N84-28404	#	AIAA PAPER 84-0685	p 31	A84-25276	#				
AD-P002840	p 102	N84-28408	#	AIAA PAPER 84-1942	p 14	A84-43469	#				
AD-P002841	p 7	N84-28410	#	ANL/ENG-PMS0-02	p 62	N84-11977	#				
AD-P002842	p 7	N84-28411	#	ANL/TM-414	p 6	N84-25524	#				
AD-P002843	p 21	N84-28413	#	AR-6	p 63	N84-21397	#				
AD-P002844	p 22	N84-28414	#								
AD-P002845	p 22	N84-28415	#								
AD-P002846	p 22	N84-28416	#								
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DE84-011205	p 55	N84-31054	#	IIASA-RR-83-29	p 20	N84-25503	#	NAS 1.26:170953	p 71	N84-15165	* #
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DE84-012576	p 78	N84-32269	#	INPE-2786-PRE/352	p 24	N84-34308	#	NAS 1.26:173562	p 52	N84-26318	* #
DE84-012664	p 2	N84-14795	#	INPE-3134-PRE/525	p 78	N84-34205	#	NAS 1.26:173564	p 52	N84-26317	* #
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								NAS 1.55:2323	p 58	N84-33266	* #
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DOE/CE-15151/1-VOL-1-EXEC-SU				ISBN-0-8330-0529-4	p 84	N84-23664	* #				
MM	p 102	N84-31038	#	ISBN-3-7045-0058-5	p 20	N84-25503	#				
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DOE/MA-0155	p 78	N84-32269	#	ISSN-C379-4059	p 95	N84-26035	#	NASA-CR-170953	p 71	N84-15165	* #
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								NASA-CR-173562	p 52	N84-26318	* #
DOT/FAA/ES-83/12	p 86	N84-29848	#	IZF-1983-20	p 18	N84-22166	#	NASA-CR-173564	p 52	N84-26317	* #
								NASA-CR-173688	p 77	N84-27756	* #
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DTNSRDC-CMLD-83/27	p 46	N84-20244	#	JPRS-UMM-84-008	p 34	N84-23913	#	NASA-CR-175342	p 44	N84-16824	* #
								NASA-CR-175412	p 72	N84-21437	* #
D6-IPAD-70016-D-1	p 30	N84-28776	* #	K/D-544	p 28	N84-14984	#				
								NASA-SP-7039(23)-SECT-1	p 100	N84-13017	* #
EPL-84-2/ONR-84-1	p 9	N84-29480	#	LA-UR-83-1207	p 15	N84-14969	#	NASA-SP-7039(23)-SECT-2	p 100	N84-13018	* #
				LA-UR-83-1392	p 2	N84-14795	#	NASA-SP-7039(24)-SECT-1	p 101	N84-20432	* #
ESA-PSS-01-10-ISSUE-1	p 95	N84-26035	#					NASA-SP-7039(24)-SECT-2	p 101	N84-20433	* #
				LA-9637-MS	p 40	N84-10807	#	NASA-SP-7500(18)	p 20	N84-26429	* #
ESA-SP-1048	p 46	N84-19179	#								
				LBL-11076	p 48	N84-22281	#	NASA-TM-85596	p 65	N84-33305	* #
ESD-TR-83-205	p 45	N84-17891	#	LBL-16321	p 52	N84-25522	#	NASA-TM-85604	p 49	N84-23150	* #
ESD-TR-83-214	p 71	N84-20247	#					NASA-TM-85908	p 56	N84-31112	* #
ESD-TR-84-150	p 51	N84-25354	#					NASA-TM-86023	p 63	N84-14965	* #
				LC-83-600545	p 41	N84-11772	#	NASA-TM-87362	p 59	N84-34321	* #
EUR-8589-EN	p 46	N84-19179	#	LC-83-600589	p 45	N84-18945	#				
				LC-83-600611	p 45	N84-18952	#	NBS-FIPS-PUB-60-2	p 57	N84-33057	#
FIPS-PUB-102	p 55	N84-30736	#	LC-83-61258	p 100	N84-11979	#				
				LC-84-601005	p 53	N84-27456	#	NBS-SP-500-102	p 41	N84-11772	#
FOUNDATION-DISCUSSION-690	p 72	N84-22510	#	LC-84-601010	p 51	N84-25331	#	NBS-SP-500-105	p 45	N84-18945	#
				LC-84-601045	p 55	N84-30740	#	NBS-SP-500-106	p 45	N84-18952	#
								NBS-SP-500-110	p 53	N84-27456	#
FTD-ID(RS)T-1525-83	p 45	N84-18107	#					NBS-SP-500-112	p 51	N84-25331	#
				LMDC-TR-84-4	p 23	N84-31035	#	NBS-SP-500-114	p 55	N84-30740	#
G-81-12(19)	p 3	N84-17842	#	LMI-AF201	p 79	N84-14115	#	NBSIR-84-2827	p 53	N84-27491	#
G-83-11(42)	p 3	N84-16066	#								
G-83-7(38)	p 3	N84-16059	#	LMI-DL401	p 54	N84-29798	#	NDU/ICAF-83/013	p 81	N84-19390	#
G-83-8(39)	p 3	N84-16067	#								
				LMI-ML214	p 95	N84-28763	#	NGB-1410.4JJ	p 59	N84-34321	* #
GAO/NSIAD-84-100	p 103	N84-31044	#								
				LMI-NA302	p 71	N84-18092	#	NLR-MP-82047-U	p 47	N84-20442	#
GAO/OACG-84-2	p 72	N84-22511	#					NLR-MP-83009-U	p 72	N84-22287	#
				MBB-UA-703-83-OE	p 69	A84-31794	#	NLR-MP-83026-U	p 36	N84-31984	#
GAO/RCED-84-129	p 57	N84-32302	#					NLR-MP-83044-U	p 53	N84-27482	#
				MBB-UR-620-83-O	p 76	N84-24495	#				
GEPP-OP-754A	p 55	N84-29802	#	MBB-UR-631-83-OE	p 61	A84-22854	#	NMAB-403	p 93	N84-23011	#
				MBB-UR-631-83-O	p 65	N84-26454	#				
				MBB-UR-673-84-OE	p 61	A84-35922	#	NOSC-CR-229	p 54	N84-28673	#
GPO-11-010	p 102	N84-24503	#								
GPO-21-495	p 100	N84-11069	#	MBB-Z-13-83-O	p 35	N84-26451	#				
GPO-21-747	p 2	N84-12713	#					NPRDC-TR-83-29	p 2	N84-14713	#
GPO-22-870	p 70	N84-10108	#					NPRDC-TR-83-34	p 71	N84-16801	#
GPO-24-902	p 100	N84-18115	#	MIL-STD-847B	p 54	N84-29799	#	NPRDC-TR-84-4	p 4	N84-20187	#
GPO-26-498	p 71	N84-17194	#								
GPO-27-827	p 65	N84-25528	#	MIS-STD-847A	p 54	N84-29799	#	NPS52-83-009	p 41	N84-12747	#
GPO-28-416	p 102	N84-24504	#					NPS54-83-002	p 91	N84-14709	#
GPO-29-312	p 6	N84-25277	#	MPAE-L-66-84-10	p 56	N84-31059	#	NPS54-83-012	p 35	N84-25357	#
GPO-29-457	p 103	N84-34319	#					NPS54-83-014	p 71	N84-20444	#
GPO-29-744	p 30	N84-25529	#	MRC-TSR-2639	p 19	N84-24309	#				
GPO-29-832	p 29	N84-19605	#	MRC-TSR-2685	p 24	N84-32268	#	NRL-8679	p 41	N84-11781	#
GPO-31-006	p 103	N84-34329	#					NRL-8780	p 71	N84-21122	#
GPO-31-453	p 102	N84-25526	#	MSD-1	p 44	N84-16824	* #				
GPO-31-912	p 36	N84-32826	#					NSF-83-29	p 62	N84-11052	#
GPO-38-705	p 103	N84-35134	#	MSRR-492	p 15	N84-12784	#	NSF/ISTI/PIR-81-05585-1	p 63	N84-14971	#
				MSRR-496	p 17	N84-20427	#				
H-REPT-98-15	p 65	N84-25528	#					NSF/OIR-83002	p 45	N84-18619	#
H-REPT-98-629	p 101	N84-21444	#	MTR-83W123	p 52	N84-26317	* #	NSF/OIR-83006	p 19	N84-24102	#
H-REPT-98-816	p 103	N84-34329	#	MTR-83W203	p 55	N84-30737	* #				
				MTR-83W68	p 52	N84-26318	* #				
H-1211	p 63	N84-14965	* #	MTR-8866	p 45	N84-17891	#	NSF/PRA-82049	p 100	N84-18095	#
H-1256	p 56	N84-31112	* #	MTR-9031	p 71	N84-20247	#	NSF/PRA-83013	p 62	N84-11052	#
				MTR-9165	p 51	N84-25354	#				
HEDL-SA-2890-FP	p 90	N84-12510	#					ONR-R-2-84	p 102	N84-24492	#
HUD-0002841	p 14	N84-11978	#	NAS 1.15:85596	p 65	N84-33305	* #	ONR-84-1	p 23	N84-29437	#
				NAS 1.15:85604	p 49	N84-23150	* #				
IAF PAPER 82-IISL-39	p 96	A84-17055	#	NAS 1.15:85908	p 56	N84-31112	* #	ONRL-R-4-84	p 34	N84-23122	#
IAF PAPER 82-IISL-52	p 67	A84-17063	#	NAS 1.15:86023	p 63	N84-14965	* #				
IAF PAPER 83-86	p 66	A84-11739	#	NAS 1.15:87362	p 59	N84-34321	* #	ORNL/CSD-126	p 16	N84-18094	#
				NAS 1.21:7039(23)-SECT-1	p 100	N84-13017	* #	ORNL/PPA-84/1	p 63	N84-21397	#
IDA-D-28	p 33	N84-19827	#	NAS 1.21:7039(23)	p 100	N84-13018	* #				
IDA-D-30	p 33	N84-20867	#	NAS 1.21:7039(24)-SECT-1	p 101	N84-20432	* #	ORNL/TM-9232	p 87	N84-32296	#
				NAS 1.21:7039(24)-SECT-2	p 101	N84-20433	* #				
IDA/HQ-83-25944	p 33	N84-19827	#	NAS 1.21:7500(18)	p 20	N84-26429	* #				
IDA/HQ-83-25964	p 33	N84-20867	#	NAS 1.26:162713	p 30	N84-28776	* #	PB83-211201	p 27	N84-11053	#
				NAS 1.26:170585	p 32	N84-11817	* #				

PB83-213637	p 62	N84-11052	#	SOM-TR-2	p 17	N84-20165	#
PB83-224063	p 100	N84-14985	#	SOM-WP-57	p 17	N84-20167	#
PB83-230870	p 100	N84-11979	#	SSRI-RR-80-2	p 18	N84-22342	#
PB83-237834	p 14	N84-11978	#	SU-TR-406	p 70	N84-12773	#
PB83-238972	p 41	N84-11772	#	TASC-TR-8203-1	p 71	N84-18158	#
PB83-250019	p 100	N84-14070	#	TDCK-78678	p 18	N84-22166	#
PB83-256594	p 63	N84-14972	#	TDI-TR-83-4	p 2	N84-15796	#
PB83-256602	p 63	N84-14971	#	TOP-1-2-610-PT-2	p 6	N84-26303	#
PB84-100734	p 100	N84-18095	#	TOP-7-3-507	p 79	N84-13146	#
PB84-118314	p 45	N84-18945	#	TR-DG-08-ONR	p 24	N84-33293	#
PB84-125210	p 45	N84-18619	#	TR-ONR-DG-06	p 20	N84-24493	#
PB84-128951	p 45	N84-18952	#	TR-113-15	p 20	N84-25353	#
PB84-144260	p 29	N84-21765	#	TR-119	p 52	N84-26473	#
PB84-150689	p 101	N84-22295	#	TR-11	p 3	N84-16059	#
PB84-154913	p 76	N84-25525	#	TR-12	p 3	N84-16067	#
PB84-157940	p 94	N84-24244	#	TR-2-ONR	p 4	N84-20185	#
PB84-161207	p 19	N84-24102	#	TR-83-44	p 16	N84-17957	#
PB84-166362	p 77	N84-27602	#	TR-83-5	p 4	N84-23112	#
PB84-167725	p 51	N84-25331	#	TR-84-7-1	p 24	N84-34191	#
PB84-171321	p 52	N84-26317	#	TTD110513000	p 37	N84-34999	#
PB84-171339	p 52	N84-26318 *	#	TUM-M8312	p 30	N84-25863	#
PB84-178029	p 53	N84-27491	#	UCRL-89432	p 2	N84-13013	#
PB84-178821	p 53	N84-27456	#	UCRL-89746	p 33	N84-13868	#
PB84-188770	p 103	N84-31044	#	UCRL-89755	p 51	N84-25367	#
PB84-189158	p 57	N84-32302	#	ULT-2002	p 94	N84-24244	#
PB84-189836	p 55	N84-30737 *	#	UMTA-URT-41-83-11	p 87	N84-33067	#
PB84-194661	p 24	N84-33138	#	UNC/ORSA/TR-83/5	p 16	N84-16925	#
PB84-195155	p 87	N84-33067	#	UNIDO/WG.383/3-ADD-1	p 101	N84-22295	#
PB84-210996	p 78	N84-32369	#	WP-16-83-84	p 17	N84-20427	#
				WP-69-82-83	p 15	N84-12784	#
				Y/CSD/INF-83/3	p 43	N84-14968	#
PNL-SA-10382	p 90	N84-13014	#	13	p 3	N84-16066	#
PNL-SA-11513	p 44	N84-14983	#				
PNL-SA-12058	p 55	N84-31041	#				
PNR-90180	p 50	N84-23386	#				
R-3083-NASA	p 84	N84-23664 *	#				
R-84-2	p 24	N84-33138	#				
RADC-TR-83-120	p 41	N84-13022	#				
RADC-TR-83-175-VOL-1	p 92	N84-21128	#				
RADC-TR-83-175-VOL-2	p 92	N84-21129	#				
RADC-TR-83-175-VOL-3	p 92	N84-21130	#				
RADC-TR-83-72	p 90	N84-11778	#				
RADC-TR-83-80	p 42	N84-13827	#				
RADC-TR-83-85-VOL-1	p 91	N84-14529	#				
RADC-TR-83-85-VOL-2	p 91	N84-14528	#				
RADC-TR-84-62-VOL-1	p 54	N84-29786	#				
RADC-TR-84-62-VOL-2	p 54	N84-29787	#				
RAND/N-2115	p 58	N84-33284	#				
RAND/N-2131-NSF	p 65	N84-33286	#				
RAND/P-6930	p 47	N84-21402	#				
RAND/P-6945	p 51	N84-24496	#				
RCC/DG-501-84	p 52	N84-25742	#				
REPRINT-893	p 50	N84-23386	#				
REPT-1080-3-VOL-1-PT-3	p 33	N84-16829	#				
REPT-1080-33-VOL-4	p 36	N84-30774	#				
REPT-1080-34	p 35	N84-30766	#				
REPT-1080-35	p 36	N84-31973	#				
REPT-14	p 3	N84-17842	#				
REPT-17-83-8	p 2	N84-14713	#				
REPT-2-20150/4R-2	p 37	N84-34999	#				
REPT-81	p 21	N84-27593	#				
RN-84-84	p 19	N84-24491	#				
S-REPT-98-260	p 102	N84-24503	#				
S-REPT-98-455	p 102	N84-24506	#				
S-REPT-98-479	p 102	N84-24504	#				
S-REPT-98-565	p 29	N84-19605	#				
SAE PAPER 831405	p 98	A84-29626	#				
SAE PAPER 831406	p 98	A84-29627	#				
SAE PAPER 831419	p 1	A84-29482	#				
SAM-TR-83-24	p 15	N84-16068	#				
SAM-TR-83-26	p 16	N84-19132	#				
SAND-84-0231	p 59	N84-34202	#				
SAND-84-0311	p 95	N84-30778	#				
SAND-84-0581C	p 55	N84-31054	#				
SAND-84-1063C	p 65	N84-32293	#				
SDM-TR-18	p 44	N84-16824 *	#				
SEL-84-001	p 49	N84-23150 *	#				
SNIAS-832-422-102	p 94	N84-25074	#				
SNIAS-832-501-101	p 76	N84-25504	#				
SNIAS-841-422-102	p 65	N84-32297	#				

MARCH 1985

N84-22312

N84-22312 # p 48
 N84-22316 # p 48
 N84-22317 # p 34
 N84-22318 # p 34
 N84-22342 # p 18
 N84-22357 # p 4
 N84-22510 # p 72
 N84-22511 # p 72
 N84-23011 # p 93
 N84-23112 # p 4
 N84-23122 # p 34
 N84-23139 # p 49
 N84-23148 # p 5
 N84-23150 # p 49
 N84-23292 # p 5
 N84-23294 # p 49
 N84-23295 # p 49
 N84-23296 # p 49
 N84-23297 # p 49
 N84-23298 # p 50
 N84-23299 # p 81
 N84-23300 # p 29
 N84-23301 # p 72
 N84-23302 # p 18
 N84-23303 # p 81
 N84-23304 # p 72
 N84-23305 # p 18
 N84-23307 # p 5
 N84-23308 # p 63
 N84-23310 # p 5
 N84-23311 # p 5
 N84-23312 # p 5
 N84-23313 # p 6
 N84-23314 # p 72
 N84-23315 # p 63
 N84-23316 # p 101
 N84-23317 # p 73
 N84-23318 # p 29
 N84-23319 # p 29
 N84-23320 # p 73
 N84-23321 # p 73
 N84-23322 # p 81
 N84-23323 # p 63
 N84-23324 # p 101
 N84-23325 # p 101
 N84-23326 # p 82
 N84-23327 # p 82
 N84-23328 # p 73
 N84-23329 # p 73
 N84-23330 # p 73
 N84-23331 # p 50
 N84-23332 # p 50
 N84-23333 # p 18
 N84-23334 # p 74
 N84-23335 # p 74
 N84-23336 # p 64
 N84-23338 # p 82
 N84-23339 # p 74
 N84-23340 # p 74
 N84-23341 # p 74
 N84-23342 # p 74
 N84-23344 # p 75
 N84-23345 # p 75
 N84-23346 # p 75
 N84-23347 # p 29
 N84-23348 # p 29
 N84-23350 # p 82
 N84-23351 # p 82
 N84-23352 # p 82
 N84-23353 # p 83
 N84-23354 # p 83
 N84-23355 # p 83
 N84-23356 # p 75
 N84-23358 # p 75
 N84-23361 # p 93
 N84-23362 # p 93
 N84-23363 # p 93
 N84-23364 # p 93
 N84-23365 # p 94
 N84-23366 # p 94
 N84-23367 # p 64
 N84-23368 # p 19
 N84-23369 # p 64
 N84-23370 # p 50
 N84-23371 # p 83
 N84-23372 # p 75
 N84-23373 # p 76
 N84-23374 # p 83
 N84-23375 # p 34
 N84-23376 # p 76
 N84-23377 # p 64
 N84-23378 # p 101
 N84-23379 # p 83
 N84-23380 # p 84
 N84-23381 # p 84
 N84-23382 # p 84

N84-23383 # p 30
 N84-23384 # p 64
 N84-23386 # p 50
 N84-23388 # p 102
 N84-23389 # p 76
 N84-23390 # p 34
 N84-23392 # p 76
 N84-23393 # p 6
 N84-23395 # p 50
 N84-23396 # p 50
 N84-23401 # p 94
 N84-23406 # p 51
 N84-23664 # p 84
 N84-23800 # p 34
 N84-23813 # p 94
 N84-23913 # p 34
 N84-23914 # p 35
 N84-23915 # p 35
 N84-23916 # p 35
 N84-24098 # p 6
 N84-24102 # p 19
 N84-24104 # p 35
 N84-24110 # p 35
 N84-24244 # p 94
 N84-24309 # p 19
 N84-24489 # p 19
 N84-24490 # p 19
 N84-24491 # p 19
 N84-24492 # p 102
 N84-24493 # p 20
 N84-24495 # p 76
 N84-24496 # p 51
 N84-24503 # p 102
 N84-24504 # p 102
 N84-24506 # p 102
 N84-25074 # p 94
 N84-25277 # p 6
 N84-25329 # p 51
 N84-25331 # p 51
 N84-25353 # p 20
 N84-25354 # p 51
 N84-25357 # p 35
 N84-25367 # p 51
 N84-25403 # p 20
 N84-25503 # p 20
 N84-25504 # p 76
 N84-25505 # p 76
 N84-25512 # p 52
 N84-25522 # p 52
 N84-25524 # p 6
 N84-25525 # p 76
 N84-25526 # p 102
 N84-25528 # p 65
 N84-25529 # p 30
 N84-25612 # p 84
 N84-25742 # p 52
 N84-25863 # p 30
 N84-26001 # p 20
 N84-26035 # p 95
 N84-26303 # p 6
 N84-26317 # p 52
 N84-26318 # p 52
 N84-26345 # p 20
 N84-26429 # p 20
 N84-26451 # p 35
 N84-26454 # p 65
 N84-26460 # p 84
 N84-26471 # p 52
 N84-26473 # p 52
 N84-26650 # p 30
 N84-26690 # p 84
 N84-26710 # p 6
 N84-26962 # p 85
 N84-27441 # p 6
 N84-27456 # p 53
 N84-27457 # p 53
 N84-27472 # p 53
 N84-27473 # p 77
 N84-27482 # p 53
 N84-27491 # p 53
 N84-27584 # p 7
 N84-27585 # p 65
 N84-27587 # p 85
 N84-27588 # p 85
 N84-27591 # p 20
 N84-27592 # p 21
 N84-27593 # p 21
 N84-27595 # p 21
 N84-27596 # p 21
 N84-27597 # p 21
 N84-27602 # p 77
 N84-27756 # p 77
 N84-28404 # p 21
 N84-28408 # p 102
 N84-28410 # p 7
 N84-28411 # p 7

N84-28413 # p 21
 N84-28414 # p 22
 N84-28415 # p 22
 N84-28416 # p 22
 N84-28424 # p 7
 N84-28425 # p 7
 N84-28447 # p 7
 N84-28448 # p 22
 N84-28450 # p 35
 N84-28451 # p 8
 N84-28452 # p 8
 N84-28455 # p 8
 N84-28461 # p 8
 N84-28462 # p 8
 N84-28463 # p 8
 N84-28464 # p 9
 N84-28466 # p 22
 N84-28467 # p 9
 N84-28468 # p 22
 N84-28474 # p 9
 N84-28479 # p 65
 N84-28480 # p 9
 N84-28485 # p 9
 N84-28662 # p 77
 N84-28663 # p 85
 N84-28665 # p 23
 N84-28666 # p 53
 N84-28670 # p 53
 N84-28671 # p 85
 N84-28672 # p 54
 N84-28673 # p 54
 N84-28678 # p 77
 N84-28763 # p 95
 N84-28776 # p 30
 N84-29026 # p 95
 N84-29437 # p 23
 N84-29480 # p 9
 N84-29495 # p 54
 N84-29786 # p 54
 N84-29787 # p 54
 N84-29788 # p 85
 N84-29792 # p 9
 N84-29798 # p 54
 N84-29799 # p 54
 N84-29802 # p 55
 N84-29848 # p 86
 N84-30709 # p 23
 N84-30717 # p 23
 N84-30736 # p 55
 N84-30737 # p 55
 N84-30740 # p 55
 N84-30748 # p 55
 N84-30766 # p 35
 N84-30768 # p 10
 N84-30769 # p 10
 N84-30770 # p 10
 N84-30774 # p 36
 N84-30778 # p 95
 N84-31033 # p 86
 N84-31035 # p 23
 N84-31037 # p 23
 N84-31038 # p 102
 N84-31039 # p 102
 N84-31041 # p 55
 N84-31044 # p 103
 N84-31054 # p 55
 N84-31056 # p 56
 N84-31059 # p 56
 N84-31062 # p 77
 N84-31107 # p 86
 N84-31112 # p 56
 N84-31122 # p 56
 N84-31164 # p 10
 N84-31166 # p 95
 N84-31175 # p 95
 N84-31179 # p 56
 N84-31192 # p 95
 N84-31196 # p 56
 N84-31197 # p 57
 N84-31494 # p 57
 N84-31743 # p 36
 N84-31920 # p 10
 N84-31971 # p 30
 N84-31972 # p 30
 N84-31973 # p 36
 N84-31984 # p 36
 N84-32230 # p 86
 N84-32231 # p 10
 N84-32232 # p 10
 N84-32234 # p 11
 N84-32239 # p 86
 N84-32240 # p 86
 N84-32241 # p 11
 N84-32253 # p 57
 N84-32255 # p 57
 N84-32259 # p 87

N84-32260 # p 11
 N84-32262 # p 87
 N84-32263 # p 77
 N84-32266 # p 11
 N84-32268 # p 24
 N84-32269 # p 78
 N84-32276 # p 11
 N84-32293 # p 65
 N84-32296 # p 87
 N84-32297 # p 65
 N84-32302 # p 57
 N84-32369 # p 78
 N84-32705 # p 96
 N84-32826 # p 36
 N84-32830 # p 31
 N84-33057 # p 57
 N84-33067 # p 87
 N84-33138 # p 24
 N84-33252 # p 11
 N84-33253 # p 24
 N84-33260 # p 58
 N84-33266 # p 58
 N84-33268 # p 58
 N84-33269 # p 58
 N84-33270 # p 58
 N84-33271 # p 58
 N84-33284 # p 58
 N84-33286 # p 65
 N84-33290 # p 87
 N84-33293 # p 24
 N84-33305 # p 65
 N84-33308 # p 87
 N84-33356 # p 58
 N84-33366 # p 87
 N84-34162 # p 12
 N84-34169 # p 12
 N84-34191 # p 24
 N84-34202 # p 59
 N84-34205 # p 78
 N84-34308 # p 24
 N84-34316 # p 59
 N84-34317 # p 12
 N84-34319 # p 103
 N84-34321 # p 59
 N84-34323 # p 59
 N84-34326 # p 59
 N84-34329 # p 103
 N84-34425 # p 88
 N84-34454 # p 103
 N84-34644 # p 25
 N84-34647 # p 66
 N84-34649 # p 36
 N84-34716 # p 66
 N84-34717 # p 66
 N84-34972 # p 36
 N84-34991 # p 36
 N84-34999 # p 37
 N84-35126 # p 37
 N84-35131 # p 59
 N84-35134 # p 103

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